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AUTHOR Strang, Ernest W.
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ABSTRACT

This document contains the fifth of five volumes reporting the activities and results of a career education evaluation project conducted to accomplsih the following two objectives: (1) to improve the quality of evaluations by career education projects funded by the United States Office of Career Education (OCE) through the provision of technical assistance to fifteen of these projects; and (2) to identify, as a result of this technical assistance effort, a field tested model which can be used by other career education projects funded by OCE in future evaluation efforts. This volume contains the design and results of a related substudy conducted to determine the relationships of career education to secondary students' career choices. Chapter 1 presents an introduction which provides the rationale for the substudy. Chapter 2 describes the evaluation design in detail. Chapter 3 contains the results obtained from the Future Plans Questionnaire administered for this study. Finally, chapter 4 presents recommendations and implications. Some of the findings reported in chapter 4 are the following: (1) female students tended to choose traditional occupations; (2) members of minority groups and females did select occupations in which members of their respective groups have been underrepresented; and (3) exposure to career education does interact with some student characteristics and affects the pattern of career choices made by students. (BM)

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TECHNICAL ASSISTANCE IN EVALUATING CAREER EDUCATION PROJECTS

Contract 300760312

FINAL REPORT
VOLUME V
THE CAREER CHOICE SUBSTUDY

Ernest W. Strang

Submitted to:

DHEW/US Office of Education
Office of Career Education

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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PREFACE

This report has been prepared pursuant to the requirements of DHEW/USOE Contract Number 300760312, *Technical Assistance in Evaluating Career Education Projects*, for the Office of Career Education. This contract was awarded to National Testing Service, Inc., (NTS) on June 21, 1976, to accomplish the following two objectives:

1. To improve the quality of evaluations conducted by OCE-funded career education projects through the provision of technical assistance to fifteen of these projects.

2. To identify, as a result of this technical assistance effort, a field tested model which could be used by other career education projects funded by OCE in future evaluation efforts.

Contractors are encouraged to provide objective, independent evaluations; therefore, none of the results or positions presented in this report necessarily reflect official Office of Career Education policy.

This is Volume V of the five volumes comprising the common Career Education Evaluation Final Report. The volumes include the following:

Volume I: Summary Volume. This volume contains highlights of the study design and results.

Volume II: The Career Education Evaluation Final Report. This, the main body of the report, contains detailed information about the background of the evaluation, the evaluation design, and the results of the evaluation. Three appendices are included, as well: (1) summaries of the fifteen local evaluations; (2) a summary of the technical assistance provided by NTS; and (3) all instruments used in the study.

Volume III: The Career Education Instrumentation Substudy. This volume contains the rationale, procedures, and results of the outcome and process instrument validation and construct definition activities undertaken by NTS under this contract.

Volume IV: Turnkey Manual for Evaluating Local Career Education Projects. The Turnkey Manual was prepared for distribution to participating projects and contains the necessary information for longitudinal continuation of this evaluation at the project level.

Volume V: The Career Choice Substudy. This volume contains the design and results of a study of the relationships of career education to secondary students' career choices.

In addition to these five common report volumes, NTS prepared unique local evaluation reports for each of the fifteen participating projects.

ACKNOWLEDGEMENTS

This report, as with the other twenty volumes in this study owes much to many different people. The students who took the time to fill out the questionnaires carefully deserve most of our thanks, though a great deal of gratitude also goes to the local project staffs, principals, and teachers. They competently handled the instrument administration for this study with very short notice on top of the very heavy burden imposed on them already by this evaluation.

That this substudy exists is due to the efforts of three people. Terry Newell, our project officer at the Office of Career Education (USOE) not only kept us on course for this effort but also provided numerous suggestions on instrumentation and analysis. Lana Muraskin of the National Institute of Education's Education and Work Group provided us with her technical expertise and substantive knowledge. More importantly, it was largely through her efforts that NIE agreed to transfer funds to the Office of Education to support this substudy under the umbrella of NTS Research Corporation's contract with USOE to provide technical assistance in career education evaluation.

Dr. Ken Hoyt, director of the Office of Career Education, kept the idea for this substudy alive when the constraints on our time and resources argued for never implementing the effort; in addition, he carefully reviewed the analysis plans and offered valuable conceptual guidance. To these three we owe special thanks.

The use of the editorial "we" in these acknowledgements is neither an expression of false modesty nor an attempt to spread the blame. Rather, it is a sincere attempt to include those at NTS who have struggled along with the author to produce this report. Pauline Matson, director of support services, Barbara Leonard, Deborah Parker, and Mary Dickens suffered through a variety of drafts to produce this final copy. Skip Anderson provided the cover design and production was supervised by Bill Roycroft. Mary Cook and Gloria Ripperton coded the open-ended career choice responses. Norm Friberg was able to coalesce the mass of "soft" data into a form the author could use and patiently explained (over and over) why it could not come out exactly as desired.

To all those people listed above and to all those who, in order to protect their confidentiality, can not be listed by name, a sincere "thank you."

Ernest W. Strang

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INTRODUCTION

This volume of the Career Education Evaluation Final Report focuses on the patterns of career choices being considered by the secondary school student respondents included in the overall study. Particular emphasis is given to the career choice patterns of females and minority group members, individuals whose choices have been limited by tradition and, in some cases, by lack of real opportunities. The rationale for this substudy is presented in this chapter; the evaluation design specific to this effort is described fully in Chapter 2. Chapter 3 contains the results obtained from the Future Plans Questionnaire administered for this study, and recommendations and implications are highlighted in Chapter 4.

The emphasis on occupational stereotyping is in keeping with career education's participatory role in attempting to change American education to reflect ongoing changes in education/work relationships. In A Primer for Career Education (Hoyt, 1977), nine prevalent assumptions about education/work relationships were challenged by career education. The seventh assumption has particular relevance here:

> FROM an assumption that says *the very best educational and occupational opportunities should be reserved for white, able-bodied males* TO an assumption that says *the full range of educational and occupational opportunities must be made available, to the greatest possible extent, to minority persons, handicapped persons, and women as well as to all others in society.* Educational and occupational stereotyping is a social disease in America today. Laws have been passed in recent years aimed at eliminating such biases from educational and occupational admittance practices. American education, however, has not responded adequately either in terms of making students aware of such laws or, more importantly, of the societal values that lead to enactment of such laws. The elimination of stereotyping cannot be accomplished by laws alone. In addition, conscious and conscientious attempts to eliminate stereotyping must become an integral part of the content and practice of American education. Refocusing American education in ways that will make this a reality represents an important part of the career education effort (p.4).

The Office of Career Education (OCE), with financial support from the National Institute of Education, expanded the Technical Assistance in Evaluating Career Education Projects contract (number 300-76-0312) with NTS Research Corporation (NTS to address some of the questions implied by Hoyt's seventh assumption. A concern with the effects of occupational stereotyping was not new to this evaluation project, however; one of the activities on which NTS collected practitioner implementation and student exposure data was "efforts to reduce sex/race stereotyping." We were gratified to find that exposure to this activity was strongly associated with positive career education learner outcome changes, even though the actual levels of exposure were not as high as might have been wished.*

Demonstrating positive relationships between levels of exposure to efforts to reduce sex and race stereotyping and

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*For a complete discussion of these results, see Chapters 5 and 6, Volume II, of this report.

career education learner outcome changes is only a partial response to the underlying problem of occupational stereotyping. Unless students actually perceive that their career opportunities are not foreclosed by tradition or other barriers, then career education has been only partially successful. This substudy goes beyond the analyses of process/outcome relationships summarized in Volume II of this report to look at the plans and aspirations of students. Hoyt said that the "elimination of stereotyping can not be accomplished by laws alone." We would add to that the point that being informed that options are open is also not sufficient. It is when that lesson is not only taught but learned, with the result that young people see a world of work of opportunities only limited by their own aptitudes, skills, and interests, not by tradition and artificial barriers, that the elimination of occupational stereotyping will have been accomplished.

Although this topic has been treated separately in this evaluation, as evidenced by discussing these results in their own volume, this effort has built upon the work in the rest of this project. In June of 1976, the Office of Career Education contracted with NTS Research Corporation to provide technical assistance in evaluation to fifteen of their funded K-12 incremental improvement projects. In addition to a need to provide each project with a unique evaluation report, OCE requested that NTS also prepare a series of "common" (or across-projects) reports. These common reports were to address the processes and outcomes of career education

as they are manifested within these fifteen projects; this *study was not conceived as a national evaluation of career education.* This point particularly holds for this Career Choice Substudy component of the common report. Data were made available voluntary by only ten of the project sites, and in only a few cases did the sample used in this study closely approximate the within-project samples used elsewhere in this report. Further, the approach used in this substudy draws heavily from the overall evaluation design. The strengths and limitations of that design are, therefore, also strengths and limitations of this component. In the following chapter, the evaluation design for the Career Choice substudy and relevant aspects of the common evaluation design are discussed in detail.

A number of recent criticisms of the career education approach suggest that career education is little more than "warmed-over vocationalism" and that, in effect, it is just a more subtle form of "tracking" students. In particular, it is said that career education may actually be fostering premature and unrealistic career choices; that is, students are possibly being encouraged to make firm choices about careers too early.* These criticisms challenge some of the basic learner outcome goals of the national career education effort--particularly goal #5: students, at the time they leave the formal educational system will be "equipped with a degree of self-understanding and understanding of education-

*c.f. Grubb, W. Norton and M. Lazerson. "Rally Round the Workplace: Continuities and Fallacies in Career Education." Harvard Educational Review 45 (November, 1975): pp. 451-474.

vocational opportunities sufficient for making sound career decisions" and goal #9: students, at the time they leave the formal educational system, will be "aware of means available to themselves for changing career options--of societal and personal constraints impinging on career alternatives."* This criticism has been of concern to career educators for some time. For example, among the issues discussed at a meeting of Chief State School Officers, USOE representatives, and others in Pinehurst, North Carolina (April 1-3, 1974), was the following: "Will we be able to avoid allowing career education to become just another way of tracking minority members such as the under-achieving culturally disadvantaged?"**

Career education should provide students with the decision-making abilities to avoid making premature and unrealistic career decisions. To be sure, active involvement in career education activities should foster greater awareness of the multiple opportunities available; this should be particularly true for groups in our society who have been traditionally relegated to a few limited career roles. The extent to which this is occuring is the focus of this study.

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*Hoyt, Kenneth B., A Primer for Career Education, Monographs on Career Education, Office of Career Education (1977); p. 35.

**Jesser, David L., "Part I: 'The Concept of Career Education,'" in Career Education: An Educational Priority for the Seventies, Project Number V 357008, HEW, Washington, D.C., 1974; p. 23.

2

OVERVIEW OF EVALUATION METHODOLOGY

For the purposes of this study, evaluation was defined as "the process of clarifying a set of information needs, and collecting, analyzing, and reporting information to alleviate those needs" (Stenner, 1973). Through a series of design conferences involving National Institute of Education, Office of Career Education, and NTS personnel, the evaluation team identified the information desired by various information users.

These information needs were expressed as policy evaluation questions grouped around a major hypothesis. The policy evaluation questions were subsequently "mapped," i.e., broken down into their basic components, and the data elements required to answer each one, as well as the necessary analysis techniques, were specified.

This chapter presents an overview of the evaluation design, including sections on the conceptual framework and policy evaluation questions, methodological perspectives, instrumentation, sampling, and analysis.

Conceptual Framework and Hypotheses

The framework for this substudy is based on the following general hypothesis: *A tendency to choose nonstereotyped careers will vary directly with a student's level of exposure to career education.* The decision to focus on this general hypothesis resulted from a series of meetings, memos, and informal communications among interested individuals at the Office of Career Education (OCE), the National Institute of Education (NIE), and NTS Research Corp. (NTS), culminating in a final design session in December, 1977. Selection of this hypothesis directed four primary characteristics of the design, each of which will be discussed fully in this chapter.

- The evaluation would focus on the choices of individual students.
- Particular attention would be given to the choices of female and minority students, students who by the nature of their demographic characteristics have had fewer and narrower career opportunities open to them.
- In keeping with the basic design used throughout this evaluation project, the level of exposure to career education concepts and activities perceived by individual students, rather than an ascribed career education-noncareer education dichotomy, would structure analysis.
- Students would have to be given latitude in making known their career choices, and the system used to code those choices would have to be extensive and flexible.

In this study, variation in the career choices made by individual students is seen as emanating from three sources. The first of these sources is the demographic characteristics of the students. Such characteristics as age, sex, and ethnicity

condition individuals' perceptions of their world, and, thus, tend to constrain the behaviors of these individuals. These characteristics can be categorized as variables within the determinants of implementation component of the implementation/process model discussed extensively in Volume II.* In that volume ethnicity in particular was seen to be strongly related to level of student reported exposure and to gains on the career education learner outcome construct measures. These demographic characteristics primarily influence career choices indirectly by operating on the student's perceptions.

The second source of variation suggested by our conceptual framework is "exposure" to career education, or, more specifically, the level of a student's reported level of exposure to career education concepts and activities. Variation in exposure to career education is itself a product of two influences: quality of implementation of career education and opportunity to learn. The level of exposure to career education exhibited by an individual student is determined partially by the level of teaching staff involvement in career education; teacher, counselor, and principal attitudes toward career education; types and frequency of career education activities engaged in by teachers, counselors, and principals; and other indicants of quality of implementation. The other source of variation in student exposure is opportunity to learn, which, at its most simplistic level, could be represented

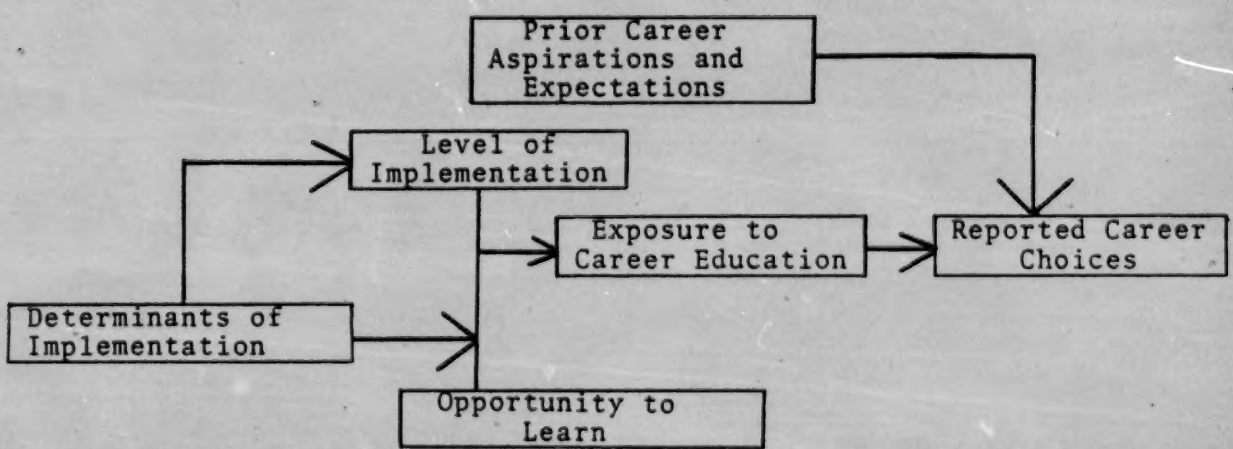
*See Chapter 5 of Volume II of this report for a discussion of the relationships of demographic variables with student reported exposure. Chapter 6 of that volume highlights the interrelationships of ethnicity, exposure, and learner outcome growth.

by daily attendance, but might be better viewed as a complex of factors including motivation, attendance, and attitude toward school. Opportunity to learn was included to ensure conceptual completeness; cost considerations, however, precluded operationalizing it in this study. Further, levels of practitioner reported implementation are presumed, in this study, to be subsumed by student reported exposure. (The parallels of student reported exposure and teacher reported implementation are discussed in Chapter 5, Volume II).

The third source of variation is the student's prior career expectations and aspirations. No direct "pre" measure was possible in this study; however, we have assumed that those prior expectations and aspirations can be approximated by adult occupational patterns. This is a clearly less than satisfactory measure, though, as a benchmark, it is all that is available. Each of these sources of variation in career choice is included in Figure 2.1, a modification of the conceptual framework used throughout this evaluation project.

Figure 2.1

Conceptual Framework for Evaluating Students' Career Choices



Thus, the conceptual framework for this substudy posits a set of determinants of implementation (demographic characteristics) which partially explains variation in the level of implementation of career education. The level of implementation interacts with opportunity to learn and the demographic characteristics to determine the level of exposure to career education enjoyed by a particular student. Level of exposure to career education, combined with a student's prior career aspirations and expectations, explains observed variation in career choice.

The conceptual framework based on the general hypothesis suggested several policy evaluation questions which formed the nucleus for this evaluation. These are:

- Are students who have high levels of exposure to career education more likely to choose nontraditional or nonstereotyped careers than students with low levels of exposure to career education?
- Are career education students who are females or members of minority groups more likely to select occupations in which members of similar groups have been underrepresented?
- Are there differential effects of exposure to career education which interact with student characteristics in explaining students' career choices?

Methodological Perspectives

In this section we discuss three methodological issues which played major roles in shaping the course of the evaluation. The issues are: (1) operationalizing career choice, (2) measuring exposure to career education, (3) estimating prior career aspirations and expectations.

Operationalizing Career Choices

A number of decisions were necessary in this area involving data collection and reduction methods and analysis approaches.

Two choices were available for data collection*: (1) use a closed-ended list of occupational titles and ask students to select their choices from that list or (2) use an open-ended format and allow students to list their own occupational choices. Each of these methods has its particular advantages and disadvantages, but the open-ended approach was selected for the following reasons. Among the weaknesses of the first approach are some which are endemic to selection from long lists, such as tendencies to choose top or bottom entries, to choose at random, to be so intimidated by the number of possibilities as to not choose at all, to have an increased possibility of not understanding some of the listed items, and to foreclose options. Two other reasons, more particular to career education, also mitigated against the use of a list: (1) career terminology is not consistent; therefore, the choices available may not parallel the students' information and (2) a listing of "occupational" choices might tend not to include such important careers as "homemaker" and ignore the other large areas of unpaid work; more importantly, such a list, unless as extensive as the Dictionary of Occupational Titles (DOT), would be incomplete by necessity. One pragmatic consideration is also important--reading through a long list and making choices is time-consuming; to add such a task to the battery already being taken by students would have led many sites to reject participation.

*Respondents were selected from the eighth and eleventh grade students included within the common design sample. See Chapter 2, Volume II for a complete discussion of the common samples; the characteristics of this substudy's sample are discussed later in this chapter.

Using the open-ended approach is not without disadvantages, of course. Chief among these is the need to "code" the responses, a time-consuming and, therefore, expensive task. Related to this problem, indeed basic to it, is the need to develop or use a suitable coding system. The resources for training coders and for providing sufficient time for the task were included in the contract extension authorizing this substudy; the selection of a coding system was not as simple. After reviewing a number of occupational classification systems, it was decided to use that developed and used by the Bureau of Census. It is brief (compared to the DOT), comprised of slightly more than 400 titles; at the same time, it has far more breadth than brief schemas such as the fifteen USOE career clusters. It includes most occupational areas, but with sufficient generality to encompass relatively nonspecific student responses. The system is compatible with other systems, such as DOT, the USOE vocational systems, and others derived from them. Of equal importance, using the Bureau of the Census occupational classification system allows ready comparability with the frequencies with which adults hold positions.

The use of two other classification systems was suggested during the design phase of this substudy: (1) coding in terms of the "people-data-things" subcodes of the DOT or (2) using Holland's* six-way classification of occupations into realistic, investigative, artistic, social, enterprising,

*Holland, John L. The Occupations Finder. Palo Alto, Ca.: Consulting Psychologists Press, 1972.

and conventional types. Both systems make comparison with adult occupational frequencies quite difficult and, by collapsing the responses into a small number of categories, run an increased risk of burying important results. Holland's system, further, was suggested following instrument administration; post hoc compatability of the resulting data with Holland's system was not possible.

Measuring Exposure to Career Education

Selecting an appropriate unit of analysis is one of the most important considerations in planning and executing an evaluation. The purpose of this evaluation, as reflected in the policy evaluation questions, is to assess the effects of career education on students' career choices. D.R. Cox (1958) notes that the unit of analysis should be "the smallest division of the experimental material such that any two units may receive different treatments in the actual experiment" (p.2). In other words, the unit of analysis should be the lowest level of aggregation at which units (e.g., students) are exposed to differential treatment.

For the purposes of the study, we wish to argue that the career education process exerts a differential effect on each individual student; there is no classroom instructional package being delivered which has identical effects on any two students within a classroom. Most career education projects claim that the career education process is implemented throughout target schools. However, the level of implementation by teachers, and subsequent student reported exposure, varies widely. Thus,

student exposure to career education can be expected to vary from individual to individual.

In keeping with this reasoning, exposure was determined to be a function of the frequencies with which students reported participation, rather than the frequencies reported by teachers or other practitioners. Students reported on their frequency of "exposure" to a variety of career education activities. These activities were suggested by local project personnel, OCE, reviews of the literature, and past evaluations of career education projects conducted by NTS. The instrumentation and analysis sections later in this chapter provide additional information about operationalizing this concept.

Estimating Prior Career Aspirations and Expectations

No direct measure of the student's pre-career education career choices was possible. The addition of this substudy came far too late in the project to allow obtaining a pre-measure. Further, to have asked eighth and eleventh grade students to provide retrospective information was judged by the evalution team as likely to provide unreliable and invalid data. It was necessary to assume, therefore, that students' prior career choices would likely be similar to the frequencies with which adults held occupations. A number of difficulties are present here, of course, including (1) that reported 1970 occupation rates are out of date, (2) students have been exposed to changes in the world of work, if only indirectly from sources outside the career education program, and (3) for census data on occupational classifications to be useful (and this applies

regardless of coding systems), the geographical area must be larger than the particular community. Nonetheless, the frequencies with which adults are employed in the occupations listed by the Bureau of the Census provide the benchmark approximation in this study of students' prior career aspirations and expectations.

Instrumentation

Collecting the data necessary for this substudy relied on two instruments directly administered to students and a checklist used by NTS staff to both code students' career choices and record adult occupational frequencies. The two student instruments included the Future Plans Questionnaire (FPQ), developed specifically for this substudy, and the Student Information Form (SIF) used for collection of student background and exposure data for all components of this evaluation project.

All determinant and exposure information, as well as a small portion of the outcome data, were collected using the SIF developed by NTS. Demographic data and school experiences were considered to be the most relevant student level determinants of implementation for explaining exposure to career education. Exposure variables covered three areas: classroom activities (e.g., simulations, discussions about job values), linkages activities (e.g., career fairs, use of library), and extra-school activities (e.g., shadowing experiences, work study programs). One outcome variable set relevant to analysis of the career choice data, i.e, student plans and expectations, was included on the SIF. As the SIF

was discussed extensively in Chapter 2, Volume II (and a copy is included in the Appendix to this volume), the remainder of this section will focus on the FPQ.

The Future Plans Questionnaire (FPQ) was used to gather data about the current career choices of the eighth and eleventh grade students included in this study. The FPQ, although quite brief, included four critical information sources: (1) student identification information; (2) whether the students have "thought about what [they] want to do"; (3) up to three open-ended responses about what careers a student wishes to pursue; and (4) how firm or definite the student is about each of those choices. These information sources parallel the order of items on the FPQ. (See the Appendix to this volume for a copy of the FPQ.)

The identification data allow linking career choice responses to the "file" of SIF data established for each of the responding eighth and eleventh grade students, thus providing additional information about each student without adding a large extra burden. Question one provides a "screen" to help eliminate irrelevant responses while also informing NTS about those students who have, as yet, not thought about their careers. The second question allows each student to provide as many as three alternative choices, while question three allows the student to clarify how firm his/her plans are for each alternative career.

The coding checklist, also included in the Appendix to this volume, merely involved slight modifications to the

census codes, primarily to ensure coverage of choices such as "travel" not included within the codes.

Sampling Plan

The initial plan for collecting career choice data involved administering the FPQ to all eighth and eleventh* grade students included within the common sample in each of the fourteen sites with students at one or another of those grade levels.** Although FPQs were returned by all sites, confusion about filling in student identification information led to the elimination of four sites. Further, it was essential to match each student's FPQ data with his/her SIF data to provide necessary demographic and exposure data. A successful match required the student to provide a complete identification number; unfortunately, failure to do so eliminated still more respondents. As a result, although nearly 7000 FPQs were completed (from a total possible sample of about 8800--this discrepancy apparently was due to the rather sudden appearance of still another instrument without sufficient lead time), only about 3300 students are included in this matched FPQ-SIF sample.

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*It was felt that asking fifth grade students about their career choices would be inappropriate. Data from grades other than eight or eleven were not analyzed in this study.

**See Chapter 2, Volume II, for a complete discussion of the common sampling design.

Table 2.1 presents the grade, sex, and ethnicity characteristics of the sample. From this table it is clear that the strength of generalizations made about the choices of each of the sex/ethnicity/grade groups, particularly for those groups containing minority students, must remain somewhat weak because of the small sample sizes.

Table 2.1

Characteristics of the Matched Career Choice Samples: Sex and Ethnicity by Grade

	Grade	
	8 (N=1535)	11 (N=1635)
% White, Males	44.0	47.1
% Minority, Males	7.8	7.3
% White, Females	41.6	37.9
% Minority, Females	6.6	7.7
% Total Females	48.2	45.6
% Total Minorities	14.2	15.2

Data Analysis

The central problem for this study is how to summarize large quantities of categorical data. Students selected well over two hundred different occupations, although many of them were chosen by only one or two students. Reducing these choices to manageable levels, while still retaining sensitivity to the wide range of choices, required combining some of the less frequently selected occupations into miscellaneous categories (e.g., "other college or university teachers," or "miscellaneous mechanics") for some analyses. While well less than ten percent of the respondents were categorized in this manner, the list of occupations was shortened to slightly over ninety, a large but more manageable total. The appendix to this volume contains the original list of coded responses, the number of students in each sex, ethnicity, and grade level group who selected the occupation, and an indication of the recoding where appropriate.

A related problem is faced in the measurement of exposure. Exposure to career education is a key concept in this substudy, as it has been throughout the evaluation project. Usually levels of exposure have been measured by student reported frequencies of participation to each of twenty-seven activities. Given the relatively limited number of cases in some of the sex-ethnicity-grade "cells" and the large number of categories for career choice, it became necessary to reduce these twenty-seven activities to a single "exposure scale."

This was accomplished by summing individual responses across activities, a step which led to a scale with a range from twenty-seven (the maximum exposure level*) to one hundred thirty-five (the minimum level). Table 2.2 summaries the characteristics of the resulting distributions for each demographic-grade level group. To determine membership in high or low exposure groups, the median for each grade level-sex-ethnicity group was used to dichotomize each of the groups; in some analyses, exposure was retained as an interval scale; and in groups with relatively large numbers of students (i.e., white groups), the responses of the first and fourth quantiles on the exposure variables were analyzed.

Table 2.2

Distribution Characteristics of the Exposure Scale By Sex, Ethnicity, and Grade Level

Sex	Ethnicity	Characteristics of Distribution	Grade Level 8	Grade Level 11
Males	White (N= 676)- Grade 8 (N=771)-Grade 11	$\bar{X}$	114.4	105.4
		SD	12.2	14.3
		Range	68.0	90.0
		Median	116.0	107.0
	Minority (N= 119) -Grade 8 (N=122) -Grade 11	$\bar{X}$	98.6	95.3
		SD	20.7	19.0
		Range	108.0	78.0
		Median	100.0	97.0
Females	White (N=641)- Grade 8 (N=616)- Grade 11	$\bar{X}$	114.2	106.1
		SD	14.4	15.5
		Range	100.0	87.0
		Median	116.0	107.0
	Minority (N= 99)- Grade 8 (N= 126)-Grade 11	$\bar{X}$	107.4	96.4
		SD	18.4	21.8
		Range	73.0	92.0
		Median	110.0	98.0

*The Activity variables were coded such that 1 = almost every day, 2 = once a week, 3 = monthly, 4 = less than monthly, and 5 = never. This gives a range of from one to five for each activity, and for twenty-seven activities, a range of 27 to 135.

The primary mode of analysis for addressing the evaluation questions is comparison. Three alternative analysis strategies are available to accomplish this; given the nature of the occupational choice data, indeed, no one strategy can give us a complete picture. Gilbert, Mosteller and Tukey (1976) suggest:

> Any attempt to infer what will be caused by an active intervention from data involving either no intervention ("natural experiments") or unrandomized intervention has to be subject to possibilities of error that are hard to evaluate. Any attempt to assert that the statistical significance or confidence associated with such an analysis allows us to conclude reliably what active intervention will do is dangerous and unsound.
>
> The best we know how to do in such a situation is to seek out alternative methods of fallible inference, use up to several of them, and then, recognizing their fallibility, trust moderately in their combined message (pp. 155-156).*

The first two analysis strategies treat the occupational choice data as purely categorical (i.e., nominal) in type. Crosstabulation of the occupational choices with the various student groupings, the first of these analyses, provides an indication of the extent to which the groups, taken together, differ across the range of choices. Secondly, comparisons of the categories chosen most frequently by each of the groups provides information on the patterns in which the choices differ for the student groups and for the adult data.

The third analysis strategy permits discussing the relationship of exposure to the occupational choices made by each of the groups in a somewhat more rigorous manner. This strategy requires, however, relaxing our assumptions about the categorical nature of the occupational choice data. As the coding system used

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*Gilbert, J.P., Mosteller, F. and Tukey, J.W. "Steady Solid Progress Requires Quantitative Evaluation to be Searching." In: C.C. Abt (Ed.), The Evaluation of Social Programs. Sage Publications, 1976.

in this study resembles an ordinal scale, to a certain extent, this relaxation is permissable. Multiple classification analysis (MCA) allows us to examine the choices made by each group, while using the level of exposure to career education as a covariate. MCA, a variety of analysis of variance, is particularly useful when a large number of classifications (i.e., white-male-eighth graders) are to be examined together while also being concerned about the interaction of each of those classifications with another variable, in this case the level of exposure. Again it must be pointed out, however, that using MCA requires us to relax our assumptions about the occupational choice data. Since the categorical assumption is retained in the first two strategies, the combination of methods provides us a series of results, each with its own strengths and weaknesses.

3

ANALYSIS AND RESULTS

Three topics are addressed in this chapter. First, the pattern of the occupational choices provided by the members of each of the student groups are described. These descriptions provide the background for the second topic, that of comparing each of the group's occupational choices with those of the other groups, focusing on the interaction of level of exposure to career education with membership in the group. The third topic extends the comparisons to include the adult occupational data. The results presented in this chapter are summarized in Chapter 4 in the responses to the evaluation questions underlying this study.

The Pattern of Students' Career Choices

The first table in this section (Table 3.1) presents the career choices made by the students in each of the grade - sex - ethnicity groups. The data on career choice presented in this table are aggregated across the three choices potentially available to each student; these data are presented both in percentage form and as the actual counts. The categories of occupations are the reduced set described in Chapter 2; for a complete listing of responses across all the categories, see the Appendix to this volume.

Table 3.1 Students' Career Choices by Grade Level, Sex, and Ethnicity

CODE #	TITLE	GRADE 8 Males White	GRADE 8 Males Minority	GRADE 8 Females White	GRADE 8 Females Minority	GRADE 11 Males White	GRADE 11 Males Minority	GRADE 11 Females White	GRADE 11 Females Minority
001	Accountants	13(1.3)		13(1.0)	1(.5)	29(3.0)	3(1.6)	21(1.6)	3(1.4)
002	Architects	35(3.5)	7(4.9)	13(1.0)		17(1.7)	1(.5)	8(.6)	
003	Computer programmers	8(.8)	1(.7)	4(.3)	1(.5)	11(1.1)	3(1.6)	5(.4)	1(.5)
005	Other Computer specialists	7(.7)	1(.7)	5(.4)	1(.5)	9(.9)	1(.5)	5(.4)	1(.5)
012	Electrical and electronic engineers	7(1.7)	1(.7)			14(1.4	3(1.6)	2(.2)	1(.5)
023	Other Engineers	16(1.6)	2(1.4)	7(.5)		51(5.1)	13(6.9)	13(1.0)	3(1.4)
025	Foresters and conservationists	38(3.8)		9(.7)	1(.5)	47(4.8)	3(.6)	17(1.3)	
026	Home management advisors	1(.1)			1(.5)	2(.2)		2(.2)	
031	Lawyers and Judges	50(5.0)	3(2.1)	43(3.2)	6(3.0)	26(2.7)	6(3.2)	29(2.2)	6(2.8)
032	Librarians	2(.2)		3(.2)				6(.5)	
036	Statisticians and mathematicians			1(.1)		13(1.3)		2(.2)	
044	Biological scientists			2(.1)		8(.8)	1(.5)	11(.8)	
052	Marine scientists	9(.9)	1(.7)	6(.4)		10(1.0)		3(.2)	1(.5)
054	Other Life and physical scientists	17(1.7)	3(2.1)	13(1.0)		25(2.5)	3(.6)	11(.8)	1(.5)
062	Dentists	16(1.6)		2(.1)	2(1.00)	2(1.2)	2(1.1)	4(.3)	1(.50)
064	Pharmacists			1(.1)		8(.8)	1(.5)	6(.6)	
065	Physicians	32(3.2)	5(3.5)	43(3.2)	12(5.9)	23(2.3)	1(.5)	18(1.4)	2(.9)
072	Veterinarians	14(1.4)	2(1.4)	64(4.7)	4(2.0)	9(.9)	1(.5)	20(1.5)	2(.9)
073	Other Health practitioners	7(.7)	2(1.4)	13(1.0)	2(1.0)		2(1.1)	7(.5)	2(.9)
075	Registered nurses	1(.1)		83(6.1)	29(14.3)	1(.1)	1(.5)	54(4.1)	17(7.9)
076	Therapists	1(.1)		30(2.2)	3(1.5)	2(.2)	1(.5)	48(3.6)	5(2.3)
080	Clinical laboratory technicians	1(.1)		3(.2)		2(.2)	1(.5)	13(1.0)	1(.5)
081	Dental hygienists			6(.4)		1(.1)		12(.9)	
083	Radiologic technicians	1(.1)		1(.1)		5(.5)		7(.5)	
085	Other Health technologists			6(.4)		4(.4)		27(2.0)	3(1.4)
090	Religious workers	2(.2)		1(.1)		5(.5)		7(.5)	
093	Psychologists	3(.3)		6(.4)	1(.5)	6(.6)		21(1.6)	1(.5)
096	Other Social scientists	9(.9)		15(1.1)		5(.5)		10(.8)	
100	Social and Recreation workers	2(.2)	1(.7)	26(1.9)	2(1.0)	7(.7)		47(3.6)	6(2.8)
123	Art, drama, and music teachers, college	3(.3)		6(.4)		1(.1)	2(1.1)	4(.3)	2(.9)
124	Coaches and P.E. teachers, college	6(.6)		6(.4)	1(.5)	5(.5)	3(1.6)	10(.8)	2(.9)
140	Other Vocation College Teachers	5(.5)	1(.7)	14(1.0)	1(.5)	10(1.0)	2(1.1)	21(1.6)	1(.5)
142	Elementary school teachers	1(.1)		20(1.5)	3(1.5)	1(.1)		22(1.7)	
143	Pre-K and K teachers			22(1.6)	2(1.0)	1(.1)		11(.8)	2(.9)
144	Secondary school teachers	6(.6)	1(.7)	17(1.2)	1(.5)	2(.2)		8(.6)	1(.5)
145	Other teachers	13(1.3)	3(2.1)	70(5.1)	17(8.4)	24(2.4)	8(4.3)	49(3.7)	9(4.2)
152	Drafting workers	8(.8)	1(.7)	1(.1)		16(1.6)	1(.5)	2(.2)	
153	Electrical technicians	5(.5)	1(.7)			8(.8)	3(1.6)	1(.1)	1(.5)
162	Other Engineering and science technicians	13(1.3)	1(.7)	7(.5)		10(1.0)		13(1.0)	1(.5)
163	Airplane pilots	36(3.6)	2(1.4)	3(.2)		16(1.6)	2(1.1)	5(.4)	
173	Other Technicians	3(.3)		7(.5)	2(1.0)	7(.7)	3(1.6)	4(.3)	1(.5)
175	Actors	4(.4)		23(1.7)	4(2.0)	11(1.1)		9(.7)	1(.5)
180	Athletes and kindred workers	87(8.7)	24(16.8)	11(.8)	1(.5)	23(2.3)	9(4.8)	5(.4)	
183	Designers	3(.3)		23(1.7)	1(.5)	1(.1)	1(.5)	23(1.7)	4(1.9)
184	Editors and reporters	3(.3)	1(.7)	10(.7)	1(.5)	6(.6)	1(.5)	19(1.4)	3(1.4)
185	Musicians and composers	7(.7)	1(.7)	26(1.9)	1(.5)	18(1.8)	3(1.6)	15(1.1)	1(.5)
191	Photographers	8(.8)	1(.7)	14(1.0)	2(1.0)	8(.8)	1(.5)	9(.7)	4(1.9)
192	Public Relations and Publicity Writers	1(.1)	1(.7)	4(.3)		4(.4)		5(.4)	
193	Radio and television announcers	11(1.1)		1(.1)	2(1.0)	8(.8)	1(.5)	2(.2)	1(.8)
194	Other Writers, artists, and entertainers	24(2.4)	8(5.6)	63(4.6)	19(9.4)	28(2.9)	7(3.7)	58(4.4)	13(6.0)
231	Sales managers and department heads, retail trade	3(.3)		1(.11)		9(.9)	2(1.1)	12(.9)	
245	Other Managers, administrators, and owners	60(6.0)	7(4.9)	20(1.5)	1(.5)	65(6.6)	11(5.9)	40(3.0)	7(3.2)
280	Sales workers and sales clerks	19(1.9)		18(1.3)	1(.5)	19(1.9)	2(1.1)	19(1.4)	6(2.8)
310	Cashiers			3(.2)		1(.1)		8(.6)	
343	Key punch operators			3(.2)	1(.5)	1(.1)		8(.6)	1(.5)
364	Receptionists			4(.3)				12(.9)	4(1.9)
370	Secretaries, legal			3(.2)				17(1.3)	
372	Other Secretaries			64(4.7)	18(8.9)		1(.5)	81(6.1)	16(7.4)
391	Typists			2(.1)				9(.7)	3(1.9)

CODE #	TITLE	GRADE 8 Male White	GRADE 8 Male Minority	GRADE 8 Female White	GRADE 8 Female Minority	GRADE 11 Male White	GRADE 11 Male Minority	GRADE 11 Female White	GRADE 11 Female Minority
394	Miscellaneous clerical workers	5(.5)	2(1.4)	16(1.2)	3(1.5)	12(1.2)	3(1.6)	41(3.1)	8(3.7)
395	Not specified clerical workers	2(.2)	2(1.4)	6(.4)		3(.3)	1(.5)	9(.7)	4(1.9)
413	Carpenters	32(3.2)	9(6.3)			19(1.9)	5(2.7)	1(.1)	
425	Decorators and window dressers			9(.7)		1(.1)		9(.7)	
430	Electricians	26(2.6)	5(3.5)			10(1.0)		1(.1)	
461	Machinists	2(.2)				5(.5)			1(.5)
462	Machinist apprentices	23(2.3)	5(3.5)	1(.1)		14(1.4)	1(.5)	2(.2)	
471	Aircraft mechanics	7(.7)	1(.7)	1(.1)		4(.4)	1(.5)	1(.1)	
472	Automobile body repair	7(.7)	1(.7)			4(.4)		1(.1)	
473	Automobile mechanics	28(2.8)	3(2.1)	5(.4)		25(2.5)	4(2.1)	1(.1)	
481	Heavy equipment mechanics	4(.4)	1(.7)			1(.1)	1(.5)		
492	Miscellaneous mechanics	5(.5)				4(.4)			
575	Other craft and kindred workers	29(2.9)	2(1.4)	11(.8)		32(3.3)	7(3.7)	7(.5)	1(.5)
680	Welders and flame-cutters	6(.6)	1(.7)			5(.5)	1(.1)		1(.5)
694	Miscellaneous operatives	18(1.8)		2(.1)		6(.6)	1(.5)	3(.2)	1(.5)
715	Truck drivers	31(3.11)	10(7.0)	5(.4)		9(.9)	4(2.0)	1(.1)	
716	Other transport operatives	3(.3)	1(.7)	2(.1)		2(.2)	1(.5)		
740	Animal caretakers, exc. farm	9(.9)	1(.7)	45(3.3)	2(1.0)	1(.1)		12(.9)	
751	Construction laborers	6(.6)	2(1.4)	1(.1)		3(.3)	1(.5)		1(.5)
785	Not specified laborers	6(.6)	1(.7)	1(.1)		8(.8)	1(.5)	4(.3)	1(.5)
801	Farmers (owners, managers, and tenants)	3(.3)	1(.7)	3(.2)	1(.5)	3(.3)			
822	Farm laborers wage workers					1(.1)		2(.2)	
824	Farm service laborers, self-employed	14(1.4)	2(1.4)	7(.5)		2(.2)	1(.5)	5(.4)	
903	Janitors and sextons	1(.1)							
912	Cooks, except private household	3(.3)		2(.1)	1(.5)	6(.6)	3(1.6)		1(.5)
915	Waiters			11(.8)					
916	Food service workers	4(.4)		6(.4)		3(.3)		3(.2)	
922	Health aides, exc. nursing			19(1.4)	1(.5)			23(1.7)	2(.9)
931	Airline flight attendants			33(2.4)	15(7.4)	1(.1)	1(.5)	22(1.7)	3(1.4)
942	Child care workers, exc, private household	1(.1)		18(1.3)	2(1.0)	1(.1)		11(.8)	1(.5)
944	Hairdressers and cosmetologists	1(.1)		28(2.1)	8(3.9)			23(1.7)	3(1.4)
955	Other Personal Service workers	1(.1)	1(.7)	2(.1)		2(.2)		5(.4)	
961	Fire protection workers	3(.3)	1(.7)			5(.5)	2(1.1)	1(.1)	1(.5)
964	Police and detective workers	24(2.4)	5(3.5)	4(.3)	5(2.5)	21(2.1)	3(1.6)	12(.9)	2(.9)
966	Other Protective service workers	3(.3)		2(.1)		4(.4)		3(.2)	
984	Maids and servants			4(.3)					
985	Homemakers	7(.7)	3(2.1)	39(2.9)	7(3.4)	5(.5)		80(6.1)	8(3.7)
995	Travel "Nothing"	7(.7)	1(.7)	5(.4)	5(.25)	15(1.5)	1(.5)	13(1.0)	7(3.2)
996	School	22(2.2)	1(.7)	13(1.0)	5(2.5)	45(4.6)	16(8.5)	66(5.0)	16(7.4)
997	Military	36(3.6)	5(3.5)	5(.4)	3(1.5)	48(4.9)	17(9.0)	12(.9)	11(5.1)
000	No Choice	[illegible]	147	834	154	861	192	975	150
	% of No Choice	48%	51%	58%	43%	47%	51%	43%	41%
	Total Responses	1,958	296	2,023	511	2,697	378	2,286	375

The percentages in each occupational category have been adjusted to exclude the nonresponses. This was done because many more students gave one choice than provided two or three choices; for example, the 676 white-male-eighth grade students in this sample had 211 who did not respond with a first career choice, 285 who provided only one choice, and 426 who provided only two.* These tables include only the responses of students who indicated they "have thought about" what they want to do. Among the observations that can be made from this table, two stand out. First, as implied above, a large proportion of the response possibilities were not filled in, ranging from 38 percent for white-female-eighth graders to 51 percent for minority-male-eighth graders. In general, females were more likely to provide multiple responses than males, and little consistency is seen between grades or between ethnic groups.

Second, a few occupations tend to gain relatively large proportions of the responses from each group, and those occupations differ somewhat across groups. Among eighth grade students, white-males' first three choices are athletes, managers or owners, and lawyers (which account for 19.5 percent of the actual responses); minority-males list athletes, truck drivers and carpenters (30.0 percent of their responses); white-females' selections are registered nurses, teachers, and veterinarians tied with other secretaries (20.6 percent); and minority females choose registered nurses, artists and entertainers, and other

*Because of this pattern of increasing nonresponse, the tables in the comparative sections of this chapter will include only the "first choice" responses listed by the students; this was determined by selecting the first "very sure" response listed by the student.

secretaries (which together account for 32.5 percent of their responses.

At the eleventh grade, the group patterns change in two ways: first, fewer students are found in the first three categories, and, second, the choices would seem to be a little more in keeping with actual opportunities (e.g., there are fewer who wish to be athletes and entertainers). White-males selected lawyers, the military, and foresters (14.9 percent of the responses); minority-males chose the military, further schooling, and lawyers (24.5 percent); white-females' three most frequently selected occupations included miscellaneous secretaries, homemakers, and further schooling (17.2 percent); and minority-females chose registered nurses, miscellaneous secretaries, and further schooling (for 22.7 percent of the responses). Given the large numbers in all the groups that opted for further schooling, it would appear that many of the eleventh graders recognized the need for more education but did not understand the directions for this item clearly.

Table 3.2 summarizes many of these results by presenting only the ten categories selected most frequently by each group. From this table alone, it is evident that most of the students' choices fall within a comparatively narrow set of occupations, though again, the selections tend to vary somewhat across groups. The proportion of responses included in this narrow set ranges from 40.3 percent (white-male-eleventh graders to 69.5 percent (minority-female-eighth graders). White students are less likely to have chosen a "popular" occupation than minority students, and eleventh graders tend to be included in

Table 3.2

Student Groups' Most Frequent Career Choices: Occupation and Selection Percentage

GRADE 8								GRADE 11							
Males				Females				Males				Females			
White	%	Minority	%	White	%	Minority	%	White	%	Minority	%	White	%	Minority	%
Athletes	(8.7)	Athletes	(16.8)	R. Nurses	(6.1)	R. Nurses	(14.3)	Managers	(6.6)	Military	(9.0)	Other Secretaries	(6.1)	R. Nurses	(7.9)
Managers	(6.0)	Truck Drivers	(7.0)	Other Teachers	(5.1)	Other Entertainers	(9.4)	Other Engineers	(5.2)	Further Schooling	(8.5)	Homemakers	(6.1)	Further Schooling	(7.4)
Lawyers	(5.0)	Carpenters	(6.3)	Veterinarians	(4.7)	Other Secretaries	(8.9)	Military	(4.9)	Other Engineers	(6.9)	Further Schooling	(5.0)	Other Secretaries	(7.4)
Foresters	(3.8)	Other Entertainers	(5.6)	Other Secretaries	(4.7)	Other Teachers	(8.4)	Foresters	(4.8)	Managers	(5.9)	Other Entertainers	(4.4)	Other Entertainers	(6.0)
Military	(3.6)	Managers	(4.9)	Other Entertainers	(4.6)	Flight Attendants	(7.4)	Further Schooling	(4.6)	Athletes	(4.8)	Registered Nurses	(4.1)	Military	(5.1)
Airline Pilots	(3.6)	Architects	(4.9)	Animal Caretakers	(3.3)	Physicians	(5.9)	Accountants	(3.0)	Other Teachers	(4.3)	Other Teachers	(3.7)	Other Teachers	(4.2)
Architects	(3.5)	Police Officers	(3.5)	Lawyers	(3.2)	Hairdressers	(3.9)	Other Entertainers	(2.9)	Other Entertainers	(3.7)	Therapists	(3.6)	Other Clerical	(3.7)
Physicians	(3.2)	Military	(3.5)	Physicians	(3.2)	Homemakers	(3.4)	Other Craftsmen	(3.3)	Other Craftsmen	(3.7)	Social Workers	(3.6)	Homemakers	(3.7)
Carpenters	(3.2)	Electricians	(3.5)	Homemakers	(2.9)	Lawyers	(3.0)	Other Scientists	(2.5)	Lawyers	(3.2)	Other Clerical	(3.1)	"Nothing"	(3.2)
Truck Drivers	(3.1)	Machinist Apprentices	(3.5)	Flight Attendants	(2.4)	Further Schooling	(2.5)	Auto Mechanics	(2.5)	Carpenters	(2.7)	Managers	(3.0)	Managers	(3.2)
% of Total Choice	43.7%		58.0%		50.2%		69.5%		40.3%		52.7%		42.8%		51.9%

the "ten first choices" list less frequently than eighth graders. No general tendency was observed for sex in this regard. Briefly, it would appear that, for almost half of the choices listed by all the students, only limited variation is present. These data, however, do not take the effects of exposure to career education concepts and activities into account. The tables included in the next section add this variable. That the student groupings do differ in their choices is clear; a crosstabulation of these groups with occupational choice provided a chi-square of 3124.3 (significant at .0001). Whether this pattern holds when exposure is added is the next topic.

Comparisons of the Student Groups' Patterns of Career Choice

Five tables are presented in this section to examine the pattern of choices of the groups compared to those of the other groups. In addition, in this section, one major focus will be on the relationships of level of exposure to the pattern of career choice. Tables 3.3-3.6 present data on the most frequently chosen occupations for each of the groups, comparing the choices within each group of high and low exposure students. In these and the other tables included in the rest of this chapter, only data for the first "very sure" occupational choice listed are used. This was done for two reasons: (1) the large proportions of students who provided only one or two choices seriously weakened the usefulness of the second and third sets and (2) the patterns of choice across the three sets, even with the nonresponses included, were fairly similar within groups, which indicated that no undue violence was being done to the choices made by individual students.*

*The rank order correlations between the first and second, and between the second and third choices for each of the groups tended to be well above .5.

The most important result in Tables 3.3-3.6 is the tendency for high exposure students to be less likely to have a chosen "common" occupation; that is, smaller proportions of high exposure students are included in the ten most frequently selected occupations. This could indicate greater awareness of the range of opportunities available to them by the high exposure students. The chi-square of the overall crosstabulation including exposure is 4664.4, significant at the .0001 level.

Other differences between high and low exposure students can be seen in the nature of their most frequently selected choices. Both high and low exposure-eighth grade-white-males (Table 3.3) tend to have selected from within a relatively small number of careers and tended to choose glamorous ones at that. The results for grade eleven-white-males are presented also in Table 3.3. Both high and low exposure-white-males listed the same first three choices; in fact, only five of the choices of the twenty listed were not selected by both high and low exposure groups. The prominent selection of musicians and athletes by the low exposure students may indicate a lack of information about realities of those respective career opportunities.

The responses of minority-males categorized by level of exposure and grade level are presented in Table 3.4. The tendency seen among male-white-eighth graders to choose glamorous occupations appears even more strongly among the grade eight-minority-males. This pattern is particularly pronounced for low exposure students. Fully thirty-eight percent of the low exposure students in this group selected the currently publicized careers of athletics and truck driving. To be sure, the high exposure students also selected those positions frequently, but not as frequently.

TABLE 3.3

Exposure and Students' Career Choices: Frequently Selected Careers

White Males

GRADE 8				GRADE 11			
h osure	%	Low Exposure	%	High Exposure	%	Low Exposure	%
letes	7.7	Athletes	8.9	Military	7.0	Further Education	9.0
yer	5.1	Physicians	6.4	Further Education	6.2	Military	6.0
ck Drivers	4.4	Architects	5.7	Foresters	4.7	Foresters	4.5
ice Officers	4.4	Lawyers	5.7	Lawyers	3.1	Architects	3.5
ther Education	4.4	Airline Pilots	4.5	Physicians	3.1	Lawyers	3.5
itary	4.4	Foresters	4.5	Other teachers	3.1	Physicians	3.5
hitects	4.4	Auto Mechanics	3.8	Auto Mechanics	3.1	Athletes	3.5
esters	4.0	Accountants	3.2	Architects	2.7	Musicians	2.5
ctricians	3.7	Veterinarians	3.2	Carpenters	2.7	Auto Mechanics	2.5
line Pilots	3.3	Electricians	3.2	Drafting	2.7	Police Officers	2.5
er Entertainers	2.9	Machinist	3.2				
		Military	3.2				
f Total ponses	48.7		55.5		38.4		41.0
xcluding responses)	273		157		257		201
onresponses	26.0		42.3		24.6		26.9

TABLE 3.4

Exposure and Students' Career Choices: Frequently Selected Careers*

Minority Males

GRADE 8				GRADE 11			
High Exposure	%	Low Exposure	%	High Exposure	%	Low Exposure	%
Athletes	19.6	Athletes	23.8	Military	14.5	Military	10.8
Carpenters	8.7	Machinists	14.3	Further Education	10.9	Further Education	10.8
Physicians	6.5	Truck Drivers	14.3	Other Engineers	7.3	Other Engineers	5.4
Health Prac.	4.3			Athletes	5.5	Other Teachers	5.4
Other entertainers	4.3			Other Entertainer	5.5	Managers	5.4
Truck Drivers	4.3			Elec. Engineers	3.6	Police Officers	5.4
Military	4.3			Lawyers	3.6		
				Printers	3.6		
% of Total Responses	52.0		52.4		54.5		43.2
N(Excluding nonresponses)	46		21		55		37
% Nonresponses	28.1		40.0		26.7		27.5

*Only those careers receiving more than one response are included in this table.

Among minority-male-eleventh graders a parallel tendency was present even when this group was divided by level of exposure.

Tables 3.5 and 3.6 present the results for female students, with white females' responses given in Table 3.5 and minority females' in Table 3.6. High and low exposure-eighth grade-white-females (Table 3.5) provide some differences in their choices; but, for the most part, the patterns are fairly similar. High exposure students do tend to distribute their choices more evenly, however, while low exposure students concentrated their choices somewhat. This concentration of choices is seen more clearly in the responses of eighth grade-minority-females (Table 3.6). Registered nurses, an occupation traditionally held mostly be women, was selected by one of six of the low exposure students; to be sure, only about one-fourth of the low exposure respondents listed "nontraditional" occupations, while about half of the high exposure-female-minority-students did so. Both high and low exposure-white-eleventh-grade-females tended to select "traditional female occupations." To be sure, the low exposure group had a slight "nontraditional" edge over the high exposure group. While this may indicate that both exposure groups' students recognized the careers in which they were more likely to be employed, these data do not give an indication that career education has changed the aspirations of these high-exposure grade eleven-female-white students. The same pattern holds among minority-females at the eleventh grade; that is, most of the positions selected tended to be traditional ones for both of the exposure groups.

Tables 3.7 and 3.8 continue these analyses for the white student groups, but restrict the presentation only to those

TABLE 3.5

Exposure and Students' Career Choices: Frequently Selected Careers

White Females

GRADE 8				GRADE 11			
gh Exposure	%	Low Exposure	%	High Exposure	%	Low Exposure	%
eg. Nurses	6.7	Reg. Nurses	11.3	Further Education	9.8	Further Education	8.1
eterinarians	6.0	Veterinarians	8.8	Other Secretaries	9.2	Homemaker	7.7
ther teachers	5.7	Lawyers	5.2	Reg. Nurses	8.1	Other Sections	7.3
ther Secretaries	5.7	Other teachers	4.1	Homemaker	3.8	Hairdressers	3.8
awyers	5.0	Physicians	3.6	Social Workers	2.9	Accountants	3.1
hysicians	4.7	Therapists	3.1	Therapists	2.6	Other teachers	3.1
usicians	3.3	Sec. Teachers	3.1	Lawyers	2.6	"Nothing"	2.7
nimal Care	3.3	Social Workers	2.6	Elem. Teachers	2.3	Lawyers	2.3
airdressers	3.0	Pre-K & K teachers	2.6	Other teachers	2.3	Veterinarians	2.3
omemakers	3.0	Animal Care	2.6	Other Entertainers	2.3	Reg. Nurses	2.3
urther Schooling	3.0			"Nothing"	2.3	Social Workers	2.3
						Elem. Teachers	2.3
						Legal Secy.	2.3
Total esponses	49.4		47.0		48.2		49.6
(Excluding onresponses)	299		194		346		260
Nonresponses	21.3		34.5		17.8		25.7

TABLE 3.6

Exposure and Students' Career Choices: Frequently Selected Careers*

Minority Females

GRADE 8				GRADE 11			
High Exposure	%	Low Exposure	%	High Exposure	%	Low Exposure	%
ther teachers	11.5	Reg. Nurses	17.1	Further Education	15.8	Further Education	11.4
ther Entertainers	9.6	Other Sec.	8.6	Reg. Nurses	14.0	Reg. Nurses	11.4
ther Secretaries	9.6	Homemakers	8.6	Other Teachers	7.0	Homemakers	9.0
hysicians	7.7	Hairdressers	5.7	Military	5.3	Lawyers	4.5
airdressers	7.7	Lawyers	5.7	Lawyers	3.5	Other teachers	4.5
awyers	3.8	"Nothing"	5.7	Reporters	3.5	Designers	4.5
herapists	3.8	Military	5.7	Other Sec.	3.5	Other Sec.	4.5
olice Officers	3.8			Hairdressers	3.5		
eg. Nurses	2.3			Typists	3.5		
total esponses	59.5		57.1		57.6		49.8
(Excluding onresponses)	52		35		57		44
Nonresponses	23.5		31.4		12.3		22.8

*Only those categories receiving more than one response are included in this table.

individuals in the highest and lowest quartiles on the exposure variable. Too few cases were available for these analyses to be conducted for minority students. Table 3.7 presents the results for those white males at the eighth and eleventh grade who were in the highest and lowest exposure quartiles.

If we assume that occupational selections such as athletes, other entertainers, and airline pilots reflect, for many students, a lack of "realism" in career choice, then the highest exposure males at both grade levels made more "realistic" choices. Highest exposure-eighth-grade-males tend to be less likely to select common choices than their lowest exposure peers. Both eleventh grade-male-exposure groups' choices reflect the tendency to choose common occupations less frequently than seen for either eighth grade group, and, further, there is little difference in this regard between eleventh grade-male-highest and lowest exposure group students. Restricting these analyses to the highest and lowest exposure scale quartiles among white males resulted in noticeable differences only for eighth graders, (i.e., very high exposure levels tend to reduce the incidence of "unrealistic" choices); at the same time, though the difference is noticeable, it is not particularly large.

The primary concern for the white-female-highest and lowest exposure group analyses is whether very high levels of exposure tend to counter the observed tendency for female students to choose "traditional" occupations more frequently as they get older. Tabl 3.8 allows us to explore this possibility. If we assume that choices such as nursing, secretarial fields, teaching, homemaking, social work, hairdressing, etc., reflect "traditional" occupations, then the following conclusions can be drawn: (1) at both grade

Table 3.7

Frequntly Selected Careers for the Highest and Lowest Exposure Scale Quartiles

White Males

Grade 8				Grade 11			
Highest Exposure Quartile	%	Lowest Exposure Quartile	%	Highest Exposure Quartile	%	Lowest Exposure Quartile	%
Athletes	9.7	Airline Pilots	7.4	Further Schooling	9.5	Further Schooling	10.2
Lawyers	6.3	Athletes	7.4	Military	8.8	Military	8.2
Truck Drivers	5.1	Architects	5.9	Managers	6.8	Other Engineers	5.1
Management Advisors	4.5	Management Advisors	5.9	Physicians	4.7	Physicians	5.1
Police Officers	4.0	Lawyers	5.9	Craft Workers	4.1	Athletes	5.1
Military	4.0	Machinists	5.9	Foresters	3.4	Architects	4.1
Other Entertainers	3.4	Auto Mechanics	5.9	Machinists	3.4	Management Advisors	4.1
Managers	3.4	Radio & T.V. Announcers	4.4				
Craft Workers	3.4	Managers	4.4				
Electricians	3.0	Military	4.4				
% Total Responses	46.8		57.5		40.7		41.9
N (Excluding Non-responses	176		68		148		98
% Nonresponses	23.8		44.7		24.9		27.4

Table 3.8

Frequently Selected Careers for the Highest and Lowest Exposure Scale Quartiles

White Females

Grade 8				Grade 11			
Highest Exposure Quartile	%	Lowest Exposure Quartile	%	Highest Exposure Quartile	%	Lowest Exposure Quartile	%
Reg. Nurses	8.4	Reg. Nurses	9.9	Other Secretaries	10.8	Further Schooling	10.3
Veterinarians	6.7	Veterinarians	8.8	Further Schooling	10.3	Homemaker	8.5
Lawyers	6.2	Lawyers	5.5	Reg. Nurses	9.2	Other Secretaries	6.8
Other Secretaries	6.2	Social & Rec. Workers	4.4	Other Entertainers	4.9	Sec. School Teachers	6.0
Physicians	5.6	Sec. School Teachers	4.4	Homemakers	4.3	Therapists	5.1
Other Teachers	5.6	Sales Workers	4.4	Social & Rec. Workers	3.2	Accountants	3.4
Other Entertainers	5.1	Child Care Workers	4.4	Accountants	2.7	Other Teachers	3.4
Musicians	3.4			Veterinarians	2.7	Hairdressers	3.4
Animal Care	3.4			Managers	2.7	"Nothing"	3.4
Further Schooling	3.4						
% Total Responses	54.0		41.8		50.8		50.3
N (Excluding non-responses)	178		91		105		117
% Nonresponses	20.5		36.4		17.1		31.2

levels, highest exposure white-females choose "traditional" occupations less frequently than lowest exposure white female groups, and this pattern is particularly pronounced at the eleventh grade level; (2) when lowest exposure-white-females are compared across grade levels, there is a tendency for eleventh grade students to choose "traditional" occupations more frequently than eighth graders; and (3) when the highest exposure-white-females are compared across grade levels, a similar tendency for older white-females to be more likely to choose "traditional" occupations appears. Thus, even though very high levels of exposure among white-females are associated with tendencies to choose "traditional" occupations less frequently than observed for the lowest exposure groups, the results did not show that very high exposure levels countered the general pattern of older females choosing "traditional" occupations more frequently than younger ones. In other words, exposure is related directly to selecting "nontraditional" occupations, but grade level differences continue to exist at about the same magnitude.

Another method of analysis relies upon multiple classification analysis (MCA)* to compare the responses of each of the eight grade level-sex-ethnicity groups while using exposure (as an interval variable) as a "covariate." Table 3.9 presents the results obtained from the MCA analysis. The "unadjusted" column reflects the relationships of each of the group characteristic variables (grade, level, sex, and race). Given the pattern of the occupational choice coding, a negative sign in this table indicates a tendency toward "white collar" occupations, while a positive sign shows a tendency

*See Chapter 2 for a discussion of this procedure.

toward selection of "blue collar" positions.* The "adjusted for independents" column reflects the same pattern after the interaction effects of the other group characteristics, or the row variables, are removed. The final column, "adjusted for independents and covariates," provides parallel data but with the effects of the level of exposure also documented.

A number of conclusions are possible from Table 3.9. In terms of grade level, sex and ethnicity do not change the career choice pattern appreciably, though exposure makes slightly more difference. Sex differences are reduced somewhat when ethnicity and grade level are considered, while the level of exposure tends to reinstate the original difference.

Table 3.9

Multiple Classification Analysis of Students' Career Choices

Group Characteristic		Unadjusted	Adjusted for Independents	Adjusted for Independents and Covariates
Grade	8	-39.6	-38.4	-35.7
	11	21.7	20.9	19.1
Sex	Male	- 6.3	- 5.3	- 6.0
	Female	5.4	4.5	5.2
Ethnicity	Minority	57.8	50.5	38.4
	White	- 7.3	- 6.4	- 4.8

*The white or blue collar designation is merely a rough indication of the type of choice. Higher number choices in the code tend to be in the operative or service sectors while lower number codes indicate professional, technical, clerical, etc. occupations.

Differences due to ethnicity are affected by the other two group characteristics to a relatively large degree, and the effects of adjusting for exposure are particularly marked, especially for minority students. These data indicate that the level of exposure to career education has been especially important for minority students and eighth graders. The other relationships are relatively inconsequential.

From a more straightforward analysis of variance perspective, statistically significant (at .01) between-group differences were found for grade level, race, and exposure. None of the two-way interactions between the grade level, sex, and ethnicity characteristics were significant, a finding which indicates the overall importance of each of the characteristics. The three-way interaction among grade level, sex, and ethnicity was statistically significant, however, at the .05 level.

Comparison of Students' Career Choices With Adult Occupational Patterns

This section adds another set of occupational choice data to the comparisons, that is, census data on the occupations in which adults were employed in 1970. The main purpose of this section is to compare the choices made by each of the exposure-grade level-sex-ethnicity groups with the appropriate adult sex-ethnicity groups.

The approach used focuses on comparing the choices of high and low exposure students to the adult occupational holding patterns. The eight tables in this section (Tables 3.10-3.17) present the ten most frequently selected (or most frequently held, for adults) occupations, with each table containing high and low exposure students for one of the sex-ethnicity groups along with the appropriate adult data. Given the fairly out-of-date adult figures, analysis in this section will be more qualitative and impressionistic than in the previous sections.

One observation readily apparent in all these tables is that student's choices tend to be much more clustered than are the adult occupational patterns. In part this is due to a strong tendency for students to choose relatively glamorous careers (e.g., athletes, entertainers, or airline pilots) or "common" ones (e.g., auto mechanics, registered nurses, or secretaries). This tendency also may indicate a relatively low level of awareness of career opportunities; an alternative explanation, however, is that students may recognize that, within a broad classification such as "auto mechanics" a large number of particular jobs can be clustered.

The main concern in this section is with the comparison of exposure groups with the appropriate adult occupational patterns. At the eighth grade level, high exposure-white males (Table 3.10) selections do not differ markedly from those of low exposure students, beyond the differences pointed out in the last section. For neither group, however, do the patterns of their choices clearly mirror the occupations of white-male adults. By examining the differences between the frequencies of each of the student exposure groups and the adult occupational rates, we can get some indication of their relative similarities. There is a slight tendency for the

TABLE 3.10

Exposure and Student's Career Choices: Comparison with Adult Occupational Patterns

Grade 8 - White - Males

Low Exposure	%	High Exposure	%	Adults	%
Athletes	8.9	Athletes	7.7	Athletes	.1
Physicians	6.4	Lawyers	5.1	Physicians	.6
Architects	5.7	Truck Drivers	4.4	Lawyers	.1
Lawyers	5.7	Police Officers	4.4	Truck Drivers	2.7
Airline Pilots	4.5	Further Education	4.4	Architects	.1
Foresters	4.5	Military	4.4	Airline Pilots	.1
Auto Mechanics	3.8	Architects	4.4	Foresters	.1
Accountants	3.2	Foresters	4.0	Police Officers	.8
Veterinarians	3.2	Electricians	3.7	Military	NA
Electricians	3.2	Airline Pilots	3.3	Accountants	1.2
Machinists	3.2	Other Entertainers	2.9	Auto Mechanics	1.8
Military	3.2			Electricians	1.0
				Veterinarians	.0
				Machinists	.8
				Other Entertainers	.1
Percentage of Total Choices	55.5		48.7		9.5

TABLE 3.11

Exposure and Students' Career Choices: Comparision with Adult Occupational Patterns

Grade 8 - Minority - Males

Low Exposure		High Exposure		Adults	
Athletes	23.8	Athletes	19.6	Athletes	.1
Machinists	14.3	Carpenters	8.7	Machinists	.5
Truck Drivers	14.3	Physicians	6.5	Truck Drivers	4.0
		Health Prac.	4.3	Carpenters	1.3
		Other Entertainers	4.3	Physicians	.2
		Truck Drivers	4.3	Health Prac.	.0
		Military	4.3	Other Entertainers	.1
				Military	NA
Percentage of Total	52.4		52.0		6.0

rankings of careers of the high exposure group to be more similar to the adults (based on careers listed in common), but the tendency is slight. The pattern is somewhat stronger for minority-males at the grade eight level (Table 3.11).

Tables 3.12 and 3.13 present the data for the eighth grade-high and low exposure-female groups in conjunction with the appropriate adult data. For white-females, high levels of exposure are not associated strongly with a tendency to select occupations in keeping with adult patterns. This finding could indicate, however, that white females are not selecting the stereotyped or traditional careers for members of their group. In this respect, the high exposure group does somewhat better. Minority-females at the eighth grade show distinct exposure-related career choice patterns. Low exposure students' choices are widely different from adult patterns, but in a stereotyped manner; the selections of this group focus on the traditional roles to a much greater extent than seen for high-exposure-minority-female-eighth graders. This pattern also shows up if the differences in frequencies across common choices are examined.

The eleventh grade exposure groups are compared to the adult patterns in Tables 3.14-3.17 for white-males, minority-males, white-females, and minority-females respectively. Few differences are apparent between the career choices of the white-male exposure groups; further, both groups resemble the adult pattern to about the same extent. In short, among white-male-eleventh graders, exposure makes little difference. As most jobs have been open traditionally to members of this sex-ethnicity group, however, such a finding is not surprising. Minority-male eleventh graders' expo-

TABLE 3.12

Exposure and Students' Career Choices: Comparison with Adult Occupational Patterns

Grade 8 - White- Female

Low Exposure		High Exposure		Adults	
Reg. Nurses	11.3	Reg. Nurses	6.7	Reg. Nurses	3.0
Veterinarians	8.8	Veterinarians	6.0	Veterinarians	.0
Lawyers	5.2	Other Teachers	5.7	Lawyers	.7
Other Teachers	4.1	Other Secretaries	5.7	Other Teachers	.4
Physicians	3.6	Lawyers	5.0	Physicians	.1
Therapists	3.1	Physicians	4.7	Other Secretaries	10.1
Sec. Teachers	3.1	Musicians	3.3	Therapists	.2
Social Workers	2.6	Animal Caretakers	3.3	Musicians	.1
Pre K and K Teach.	2.6	Hairdressers	3.0	Animal Caretakers	.0
Animal Caretakers	2.6	Homemakers	3.0	Sec. Teachers	1.8
		Further Schooling	3.0	Social Workers	.5
				Hairdressers	1.5
				Pre-K and K Teach.	.4
				Homemakers	NA
				Further Schooling	NA
Percentage of Total Choices	47.0		49.4		18.8

TABLE 3.13

Exposure and Students' Career Choices: Comparison with Adult Occupational Patterns

Grade 8 - Minority - Female

Low Exposure		High Exposure		Adults	
Reg. Nurses	17.1	Other Teachers	11.5	Other Secretaries	3.5
Other Secretaries	8.6	Other Entertainers	9.6	Reg. Nurses	1.7
Homemakers	8.6	Other Secretaries	9.6	Other Teachers	.1
Hairdressers	5.7	Physicians	7.7	Homemakers	NA
Military	5.7	Hairdressers	7.7	Other Entertainers	.1
Lawyers	5.7	Lawyers	3.8	Hairdressers	1.2
"Nothing"	5.7	Therapists	3.8	Physicians	.0
		Police Officers	3.8	Lawyers	.0
		Reg. Nurses	2.3	Therapists	.1
				Police Officers	.0
				Military	NA
Percentage of Total Choices	57.1		59.5		6.6

TABLE 3.14

Exposure and Students' Career Choices: Comparison with Adult Occupational Patterns

Grade 8 - White - Males

Low Exposure		High Exposure		Adults	
Further Education	9.0	Military	7.0	Military	NA
Military	6.0	Further Education	6.2	Further Education	NA
Foresters	4.5	Foresters	4.7	Foresters	.1
Architects	3.5	Lawyers	3.1	Lawyers	.1
Lawyers	3.5	Physicians	3.1	Architects	.1
Physicians	3.5	Other Teachers	3.1	Physicians	.6
Athletes	3.5	Auto Mechanics	3.1	Other Teachers	.1
Musicians	2.5	Architects	2.7	Musicians	.1
Auto Mechanics	2.5	Carpenters	2.7	Athletes	.1
Police Officers	2.5	Drafting	2.7	Auto Mechanics	1.7
				Carpenters	1.8
				Drafting	.6
				Police Officers	.8
Percentage of Total Choices	41.0		38.4		6.1

TABLE 3.15

Exposure and Students' Career Choices: Comparison with Adult Occupational Patterns

Grade 11 - Minority - Males

Low Exposure		High Exposure		Adults	
Military	10.8	Military	14.5	Military	NA
Further Education	10.8	Further Education	10.9	Further Education	NA
Other Engineers	5.4	Other Engineers	7.3	Other Engineers	.1
Other Teachers	5.4	Athletes	5.5	Athletes	.1
Managers	5.4	Other Entertainers	5.5	Other Entertainers	.1
Police Officers	5.4	Elec. Engineers	3.6	Other teachers	.1
		Lawyers	3.6	Managers	3.0
		Printers	3.6	Police Officers	.5
				Elec. Engineers	.0
				Lawyers	.2
				Printers	.2
Percentage of Total Choices	43.2		54.5		4.3

TABLE 3.16

Exposure and Students' Career Choices: Comparison with Adult Occupational Patterns

Grade 11 - White - Females

Low Exposure		High Exposure		Adults	
Further Education	8.1	Further Education	9.8	Further Education	N/A
Homemaker	7.7	Other Secretaries	9.2	Homemaker	N/A
Other Secretaries	7.3	Reg. Nurses	8.1	Other Secretaries	10.1
Hairdressers	3.8	Homemaker	3.8	Reg. Nurses	3.0
Accountants	3.1	Social Workers	2.9	Other Teachers	.4
Other Teachers	3.1	Therapists	2.6	Lawyers	.7
"Nothing"	2.7	Lawyers	2.6	Accountants	.0
Lawyers	2.3	"Nothing"	2.3	Therapists	.2
Veterinarians	2.3	Elem. Teachers	2.3	Social Workers	.5
Reg. Nurses	2.3	Other Teachers	2.3	Elem. Teachers	4.3
Social Workers	2.3	Other Entertainers	2.3	Other Entertainers	.0
Elem. Teachers	2.3			Hairdressers	1.5
				Veterinarians	.0
Percentage of Total Choices	49.6		48.2		20.7

TABLE 3.17

Exposure and Students' Career Choices: Comparison with Adult Occupational Patterns

Grade 11 - Minority - Females

Low Exposure		High Exposure		Adults	
Further Education	11.4	Further Education	15.8	Further Education	N/A
Reg. Nurses	11.4	Reg. Nurses	14.0	Reg. Nurses	1.7
Homemaker	9.0	Other Teachers	7.0	Other Teachers	.1
Lawyers	4.5	Military	5.3	Other Secretaries	3.5
Other teachers	4.5	Lawyers	3.5	Lawyers	.0
Designers	4.5	Reporters	3.5	Homemakers	N/A
Other Secretaries	4.5	Other secretaries	3.5	Military	N/A
		Hairdressers	3.5	Reporters	.0
		Typists	3.5	Designers	.0
				Hairdressers	1.2
				Typists	2.8
Percentage of Total Choices	49.8		57.6		9.3

sure groups have only one shared occupation (i.e., other engineers); consequently little can be said about the relationship of exposure to this group's choices in comparison to adult patterns.

As pointed out in the previous section, exposure did not differentiate white females to any marked degree. Table 3.16 reiterates this point, but it also presents data indicating the relative similarity (at least in comparison to the other ethnicity-sex group results presented in this section) to the adult occupational patterns. Although this may indicate a large degree of awareness about probable opportunities, it also illustrates a strong tendency to accept traditional roles. Although the same pattern is present, to a lesser extent, among minority-females at the eleventh grade, the lack of many comparable choices limits our analysis.

In general, it is clear that there are differences between the grade level-sex-ethnicity groups' career choices and that the level of exposure is related differently with the patterns of career choices for each of the groups. The relationships of exposure to career choice does not hold uniformally across the groups; members of some groups (e.g., white-male-eleventh graders) largely were unaffected by exposure, while exposure was related strongly to the career choices of members of other groups (e.g., minority-male-eighth graders).

4

IMPLICATIONS

This study began with the following general hypothesis: A tendency to choose nonstereotyped careers will vary directly with a student's level of exposure to career education. To address this hypothesis, three policy evaluation questions focused the analysis. This chapter briefly addresses each of these questions and concludes with the response to the general hypothesis.

- Are students who have high levels of exposure to career education more likely to choose non-traditional or nonstereotyped careers than students with low levels of exposure to career education?

Female students at both grade levels tended to choose traditional occupations; this tendency was particularly strong among eleventh graders and between exposure groups at both grade levels. Exposure had the strongest relationships among eighth grade white females; high exposure students in this group were about twice as likely to list nontraditional choices as the low exposure students. This pattern persisted when only the choices of white females in the highest and lowest exposure scale quartiles were examined. Differences related to exposure were more prominent for the groups when examined by ethnicity. High levels of exposure

were associated with tendencies by minority students to select less glamorous jobs and, simply, more of them, based on examination of the lists of the most frequently selected careers. Similar results were found from the multiple classification analysis.

- Are career education students who are females or members of minority groups more likely to select occupations in which members of similar groups have been underrepresented?

The data indicated clearly that members of minority groups and females did select occupations in which members of their respective groups have been underrepresented. In part, this was simply a function of the patterns of career choices made by the students; that is, they tended to list a relative handful of occupations when compared to the range of adult positions. As a result, the frequencies of choice for the students were likely to be larger than the frequencies of occupation holding. Nonetheless, women and minority group members did tend to select occupations which have traditionally been the preserve of white males, such as physicians and lawyers. Again, however, given the tendency of the students to select frequently only a few occupations, these findings must remain somewhat suspect.

- Are there differential effects of exposure to career education which interact with student characteristics in explaining student's career choices?

Exposure does interact with some student characteristics and affects the pattern of career choices made by students. To be sure, there are also some interactions among the student characteristics. Multiple classification analysis was used to address this question; it produced a number of intriguing findings. In terms of grade level, sex and ethnicity do not change the career choice pattern appreciably, though exposure makes slightly more difference.

Sex differences are reduced somewhat when ethnicity and grade level are considered, while the level of exposure tends to reinstate the original difference. Differences due to ethnicity are affected by the other two group characteristics to a relatively large degree, and the effects of adjusting for exposure are particularly marked, especially for minority students. These data indicate that the level of exposure to career education has been especially important for minority students and eighth graders. The other relationships are relatively inconsequential.

In summary, although there is some tendency for a student's level of exposure to career education concepts and activities to be related directly to the choice of nonstereotyped careers, this tendency operates primarily through interaction with specific demographic characteristics. White-males' choices are largely unaffected by exposure to career education. White-females' choices apparently are more the result of grade level than exposure as are the choices of minority-females, with eighth graders tending to select more nontraditional roles. It is among minority-males, especially at the eighth grade level, that the effects of exposure on the patterns of career choices are particularly in evidence.

This substudy was initiated in keeping with career education's participatory role in attempting to change American education to reflect ongoing changes in education/work relationships. The concern with occupational stereotyping reflects one of these ongoing changes, and this study has attempted to document, from one perspective, the relationship of career education to this change.

Despite the limitation of a very short time-line for preparing instruments (and the conceptual framework behind them) for this

substudy, the Future Plans Questionnaire does appear to have elicited the career choices of the sampled students. That these choices tend to be clustered within a narrow set of careers probably tells us more about the level of career awareness of the students than their tendencies to select nontraditional careers. Nonetheless, it does appear that exposure to career education, even if only by affecting career awareness (see Chapter 6, Volume II), is related to tendencies for young women and minority group members to be more likely than those with less exposure to choose careers in which members of their groups have been traditionally underrepresented.

In our discussion of specific career education process-learner outcome relationships in Chapter 6, Volume II, one of the activities which stood out consistently as being related positively and consistently to most of the outcomes was classroom exposure to situations designed to reduce race and sex occupational stereotyping. Combining that finding with those presented in this substudy leads to a general conclusion that this topic is one that deserves extra attention from those who design career education programs and, particularly, from the practitioners who implement those programs.

One finding in this study deserves future attention; that is eleventh grade female and minority group members tended to choose careers more in line with traditional roles than their younger colleagues. Career education is attempting to expand the options of young people, yet the results indicate that older students' options are relatively narrow. Without longitudinal data we can not say of course, that there is a change between the eighth and eleventh grades away from a more open set of career options to a narrower, more stereotyped array of perceived opportunities. Nonetheless, it may well be that older students, face-to-face with making their

ways in the world, will tend to seek the safer routes. If so, there is a conflict between the option-expanding goal of career education and the realities perceived by students.

APPENDIX

Three appendices are included in this volume. Appendix A contains copies of the Student Information Form and the Future Plans Questionnaire, the instruments used to gather the data for this substudy Appendix B contains a copy of the Census Occupational Classification used for coding the student data and reading the adult data reported in Chapter 3. Appendix C contains the actual response counts organized by grade level-sex-ethnicity group. Only the census code numbers are used in those lengthy tables, for translation of those numbers into job titles the reader is referred to the list included in Appendix B.

APPENDIX A

STUDENT INFORMATION FORM

IMPORTANT DIRECTIONS FOR MARKING THIS SHEET

- Use black lead pencil only (No. 2 or No. 2½).
- Do NOT use ink or ballpoint pen.
- Make heavy black marks that fill the circle completely.
- Erase cleanly any response you wish to change.
- Make no stray marks on this sheet.

IMPROPER MARKS	PROPER MARKS
✓ ○ ○ ⊗ ○ ⊘	● ○ ○ ● ● ○

School System Name:

School Name:

School Codes	Teacher I.D.	Student I.D.

Sex: (Mark one)

- ○ Male
- ○ Female

How old are you? (Mark your age)

○ 9	○ 13
○ 10	○ 14
○ 11	○ 15
○ 12	○ 16

Birthdate: (Fill in the circle next to the month in which you were born.)

○ January	○ July
○ February	○ August
○ March	○ September
○ April	○ October
○ May	○ November
○ June	○ December

1. How do you describe yourself? (Mark one)

- ○ American Indian or Alaskan Native
- ○ Asian or Pacific Islander
- ○ Black/Negro
- ○ Caucasian/White
- ○ Hispanic (Mexican American, Chicano, Puerto Rican, or other Spanish culture or origin)

2. How many brothers and sisters do you have? (Mark one)

- ○ None
- ○ One
- ○ Two
- ○ Three
- ○ Four
- ○ Five or more

3. How far did the following persons go in school? (Mark one answer in each appropriate column)

Education	Your Father	Your Mother
Less than eighth grade	○	○
Completed eighth grade	○	○
Some high school, but did not graduate	○	○
Graduated from high school	○	○
Technical, nursing, or business school after high school	○	○
Some college but less than 4 years	○	○
Graduated from a 4 year college	○	○
Attended graduate or professional school after college	○	○
Don't know	○	○

4. Which one of the following best describes your grades so far in school? (Mark one)

- ○ Mostly A (90–100)
- ○ About half A and half B (85–90)
- ○ Mostly B (80–84)
- ○ About half B and half C (75–79)
- ○ Mostly C (70–74)
- ○ About half C and half D (65–70)
- ○ Mostly D (60–64)
- ○ Mostly below D (below 60)

1977, National Testing Service, Inc., EZEX-CE-001-S.D.

5. **Approximately what is the average amount of time you spend on <u>all</u> of your homework during the week?** (Mark one)
- ○ Homework is not usually assigned
- ○ I have homework but don't do it
- ○ Less than 5 hours a week
- ○ Between 5 and 10 hours a week
- ○ More than 10 hours a week

6. **Which of the following do you have in your home?** (Mark one on each line)

Have	Do Not Have	
○	○	A specific place to study
○	○	Daily newspaper
○	○	Dictionary
○	○	Encyclopedia
○	○	Magazines
○	○	Record player
○	○	Tape recorder or cassette player
○	○	Color television

7. **How much television do you usually watch each school night?** (Mark one)
- ○ None
- ○ Less than an hour
- ○ About one hour
- ○ About two hours
- ○ About three hours
- ○ About four hours
- ○ About five hours
- ○ More than five hours

The following questions are only for those in junior high school (middle school) or high school. If you are in elementary school (grade school — grades 4, 5, 6), skip the rest of this part of the survey and go on to Part 2.

8. **What is the highest level of schooling that <u>you think you will get</u>? At a minimum do you expect to:** (Mark one)
- ○ Quit school as soon as possible
- ○ Graduate from high school
- ○ Graduate from a vocational, technical, trade or business school
- ○ Graduate from a two-year or junior college
- ○ Graduate from a four-year college or university
- ○ Graduate from a graduate or professional school after college

9. **How often have you discussed your plans for after high school with the following people?** (Mark only one on each line)

Never	Seldom	Often	
○	○	○	Your parent(s)
○	○	○	A relative other than your parents
○	○	○	A guidance counselor
○	○	○	A teacher other than a guidance counselor
○	○	○	The principal or assistant principal
○	○	○	Clergy (minister, priest, rabbi, etc.)
○	○	○	State employment service officer
○	○	○	An adult not mentioned above
○	○	○	Friends your own age

10. **About how many hours a week do you normally work at a paid job outside your home in addition to going to school?** (Mark one)
- ○ None
- ○ 1–5 hours per week
- ○ 6–10 hours per week
- ○ 11–15 hours per week
- ○ 16–20 hours per week
- ○ More than 20 hours per week

11. **About how many hours a week do you normally spend doing non-paid volunteer work outside your home (such as work in a hospital)?** (Mark one)
- ○ None
- ○ 1–5 hours per week
- ○ 6–10 hours per week
- ○ 11–15 hours per week
- ○ 16–20 hours per week
- ○ More than 20 hours per week

12. **If there were no obstacles, what is the highest level of schooling you would <u>like</u> to get? At a minimum would you like to:** (Mark only one)
- ○ Quit school and go to work as soon as you are old enough
- ○ Graduate from high school
- ○ Graduate from vocational, technical, trade or business school
- ○ Graduate from a two-year or junior college
- ○ Graduate from a four-year college or university
- ○ Graduate from a graduate or professional school after college

The remaining questions are only for high school students (grades 10, 11, 12). If you are not in high school, skip the rest of Part 1 and go on to Part 2.

13. What are your feelings about your school? (Mark only one answer in each line)

Agree	Disagree	Does Not Apply	
○	○	○	Most required courses here are a waste of time
○	○	○	School should have placed more emphasis on vocational and technical programs
○	○	○	School did not offer enough practical work experience
○	○	○	School provided me with counseling that will help me continue my education
○	○	○	School gave me new ideas about the type of work I want to do
○	○	○	School provided me with counseling that helped me get a better idea of myself and my relations with other people
○	○	○	School provided me with counseling that will help me find employment
○	○	○	School should help students find jobs when they leave school
○	○	○	School should have placed more emphasis on basic academic subjects (math science, English, etc.)
○	○	○	School helped me learn that the career I choose should not be limited by my sex or race

14. About how many hours of your time during a typical school day is spent in each of the following activities? (Mark only one answer in each line; if none of the choices is exactly correct, choose the one that is closest)

No. of Hours								
None	Less than 1 hour	1	2	3	4	5	6 or more	
○	○	○	○	○	◔	○	○	Academic or college preparation courses
○	○	○	○	○	○	○	○	General courses (e.g. art, music, physical education)
○	○	○	○	○	○	○	○	Vocational/Technical courses
○	○	○	○	○	○	○	○	Working outside the school as part of the school program
○	○	○	○	○	○	○	○	Extracurricular activities (e.g. band, school clubs, etc.)

15. How important was each of the following factors in determining the kind of work you plan to be doing for most of your life? (Mark only one on each line)

Not Important	Somewhat Important	Very Important	
○	○	○	Previous work experience in the area
○	○	○	Relative or friend in the same line of work
○	○	○	Job openings available in the occupation
○	○	○	Work matches a hobby interest of mine
○	○	○	Good income to start or within a few years
○	○	○	Job security and permanence
○	○	○	Work that seems important and interesting to me
○	○	○	Freedom to make my own decisions
○	○	○	Opportunity for promotion and advancement in the long run
○	○	○	Meeting and working with sociable, friendly people

16. Which one of the following best describes your plans for the year after you leave high school? (Mark as many as apply)

- ○ Working full-time
- ○ Entering an apprenticeship or on-the-job training program
- ○ Going into regular military service
- ○ Being a full-time homemaker
- ○ Taking vocational or technical courses at a trade or business school
- ○ Taking mostly academic courses at a junior or community college
- ○ Taking mostly technical or vocational subjects at a junior or community college
- ○ Attending a four-year college or university
- ○ Working part-time
- ○ Other (travel, take a break, no plans)

Complete the following question only if you marked more than one answer in Question 16. If you marked only one answer in Question 16, please turn to Part 2 and continue.

17. Of the answers you marked in Question 16, which one answer best describes how you will spend the major share of your time in the year after you leave high school? (Mark one)

- ○ Working full-time
- ○ Entering an apprenticeship or on-the-job training program
- ○ Going into regular military service
- ○ Being a full-time homemaker
- ○ Taking vocational or technical courses at a trade or business school
- ○ Taking mostly academic courses at a junior or community college
- ○ Taking mostly technical or vocational subjects at a junior or community college
- ○ Attending a four-year college or university
- ○ Working part-time
- ○ Other (travel, take a break, no plans)

PART 2: STUDENT ACTIVITY CHECKLIST

Please indicate how often you take part in the activities listed below. Mark the circle that is closest to what you think is the correct answer. If you have taken part, mark (a) almost every day, (b) once a week, (c) once or twice a month, (d) less than once a month. If you have never taken part in the activity, mark (e) never.

(a) Almost every day
(b) Once a week
(c) Once or twice a month
(d) Less than once a month
(e) Never

1. ○ ○ ○ ○ ○ Use TV, tapes, filmstrips or radio to learn about jobs
2. ○ ○ ○ ○ ○ Attend a career fair (a place where many different people come to talk about their jobs)
3. ○ ○ ○ ○ ○ Talk about jobs and careers with groups of students
4. ○ ○ ○ ○ ○ Go around with workers to learn what they do on their jobs
5. ○ ○ ○ ○ ○ Talk about how people in certain jobs and careers may have certain attitudes and values
6. ○ ○ ○ ○ ○ Study the interests and abilities people need to have for particular jobs and careers
7. ○ ○ ○ ○ ○ Talk with the class about what was learned about careers on field trips
8. ○ ○ ○ ○ ○ Use the library or learning center to learn about careers
9. ○ ○ ○ ○ ○ Take part in class activities where we pretend we are in different jobs
10. ○ ○ ○ ○ ○ Go on field trips to business or industries to learn what people do in their jobs
11. ○ ○ ○ ○ ○ Talk about how reading and arithmetic will be important to me in my future jobs and career
12. ○ ○ ○ ○ ○ Listen to workers (other than parents of students in the class) talk to the class about the work that they do
13. ○ ○ ○ ○ ○ Listen to the parents of other students in the class talk to the class about what they do in their work
14. ○ ○ ○ ○ ○ Take tests to find out how much I know about different jobs and what people in them do
15. ○ ○ ○ ○ ○ Take home material from class so that my parents can help me learn about jobs and what work I might want to do
16. ○ ○ ○ ○ ○ Listen to my parents talk about what they do at their work
17. ○ ○ ○ ○ ○ Ask my parents questions about what they do at work
18. ○ ○ ○ ○ ○ Hear that a person can choose any job and that a person's sex or race should not matter in making a job choice
19. ○ ○ ○ ○ ○ Talk about my own values about work
20. ○ ○ ○ ○ ○ Attend meetings of groups that are learning about jobs and careers such as the Future Farmers of America, Future Teachers of America, 4H, Future Homemakers of America, and Junior Achievement, when I am not in school

The following items are only for junior high (middle school) or high school students. If you are in elementary school (grade school — grades 4, 5, or 6), you are done with this survey.

21. ○ ○ ○ ○ ○ Hear about how to look for and get a job (such as how to read want ads, how to fill out a resume, how to conduct myself in an interview)
22. ○ ○ ○ ○ ○ Get personal advice from people in the school about my future job possibilities
23. ○ ○ ○ ○ ○ Receive personal advice from people at school about future education possibilities and how to apply to college
24. ○ ○ ○ ○ ○ Take tests to find out about my job interests and skills
25. ○ ○ ○ ○ ○ Get personal help from people in the school in finding a paid job (either part-time or full-time)
26. ○ ○ ○ ○ ○ Take part in a school-supervised work experience or work-study program
27. ○ ○ ○ ○ ○ Talk about the steps to take in making career decisions

S.C.	S.C.	S.C.	
0 0 0 0 0 0	0 0 0 0 0 0	0 0 0 0 0 0	DO NOT MARK IN THIS SHADED AREA
1 1 1 1 1 1	1 1 1 1 1 1	1 1 1 1 1 1	
2 2 2 2 2 2	2 2 2 2 2 2	2 2 2 2 2 2	
3 3 3 3 3 3	3 3 3 3 3 3	3 3 3 3 3 3	
4 4 4 4 4 4	4 4 4 4 4 4	4 4 4 4 4 4	
5 5 5 5 5 5	5 5 5 5 5 5	5 5 5 5 5 5	
6 6 6 6 6 6	6 6 6 6 6 6	6 6 6 6 6 6	
7 7 7 7 7 7	7 7 7 7 7 7	7 7 7 7 7 7	
8 8 8 8 8 8	8 8 8 8 8 8	8 8 8 8 8 8	
9 9 9 9 9 9	9 9 9 9 9 9	9 9 9 9 9 9	

FUTURE PLANS

The questions in this section will help us to find out more about your plans for the future after you finish all the schooling you expect to get.

Student ID Number: _____ (from answer sheet)

School Name: _____

School System Name: _____

(Please fill in the above blanks as indicated; your student ID number can be found on your other answer sheet.)

1. Have you thought about what you want to do after you finish all the schooling you expect to get? (Circle the letter that most closely reflects what you want to do.)

   a. Yes, I have thought about what I want to do after finishing all the schooling I expect to get.
   b. No, I have not thought about what I want to do after finishing all the schooling I expect to get.

If you circled letter "a", please answer the next two questions. If you circled letter "b", you have finished with this part of the questionnaire.

2. What do you plan to do after you finish all the schooling you expect to get? (Write in the choices or alternatives you are thinking about on the lines provided below. Be as specific as you possibly can. You may write in up to three different choices or alternatives.)

This section is used for answers to Question 3.

	Very Sure	Fairly Sure	Not Very Sure	Not Sure At All
a. _____	☐	☐	☐	☐
b. _____	☐	☐	☐	☐
c. _____	☐	☐	☐	☐

3. Now please go back and look at each of the choices or alternatives you listed. Indicate how firm or definite your plans are about each of the choices by checking the boxes ☐ next to your choices that correspond to whether you are (a) "very sure that I want to do this," (b) "fairly sure that I want to do this," (c) "not very sure that I want to do this," or (d) "not sure at all that I want to do this."

Thank you very much for filling out this questionnaire.

APPENDIX B

OCCUPATIONAL CLASSIFICATION SYSTEM

Equivalent numeric codes follow the alphabetic codes. Either code may be utilized, depending on the processing method. "N.e.c." means "not elsewhere classified."

Occupation Code	PROFESSIONAL, TECHNICAL, AND KINDRED WORKERS
001	Accountants
002	Architects
	Computer specialists
003	Computer programmers
004	Computer systems analysts
005	Computer specialists, n.e.c.
	Engineers
006	Aeronautical and astronautical engineers
010	Chemical engineers
011	Civil engineers
012	Electrical and electronic engineers
013	Industrial engineers
014	Mechanical engineers
015	Metallurgical and materials engineers
020	Mining engineers
021	Petroleum engineers
022	Sales engineers
023	Engineers, n.e.c.
024	Farm management advisors
025	Foresters and conservationists
026	Home management advisors
	Lawyers and judges
030	Judges
031	Lawyers
	Librarians, archivists, and curators
032	Librarians
033	Archivists and curators
	Mathematical specialists
034	Actuaries
035	Mathematicians
036	Statisticians
	Life and physical scientists
042	Agricultural scientists
043	Atmospheric and space scientists
044	Biological scientists
045	Chemists
051	Geologists
052	Marine scientists
053	Physicists and astronomers
054	Life and physical scientists, n.e.c.
055	Operations and systems researchers and analysts
056	Personnel and labor relations workers
	Physicians, dentists, and related practitioners
061	Chiropractors
062	Dentists
063	Optometrists
064	Pharmacists
065	Physicians, medical and osteopathic

Occupation Code	PROFESSIONAL TECHNICAL AND KINDRED WORKERS-Continued
	Nurses, dietitians, and therapists
074	Dietitians
075	Registered nurses
076	Therapists
	Health technologists and technicians
080	Clinical laboratory technologists and technicians
081	Dental hygienists
082	Health record technologists and technicians
083	Radiologic technologists and technicians
084	Therapy assistants
085	Health technologists and technicians n.e.c.
	Religious workers
086	Clergymen
090	Religious workers, n.e.c.
091	Economists
092	Political scientists
093	Psychologists
094	Sociologists
095	Urban and regional planners
096	Social scientists, n.e.c.
	Social and recreation workers
100	Social workers
101	Recreation workers
	Teachers, college and university
102	Agriculture teachers
103	Atmospheric, earth, marine, and space teachers
104	Biology teachers
105	Chemistry teachers
110	Physics teachers
111	Engineering teachers
112	Mathematics teachers
113	Health specialties teachers
114	Psychology teachers
115	Business and commerce teachers
116	Economics teachers
120	History teachers
121	Sociology teachers
122	Social science teachers, n.e.c.
123	Art, drama, and music teachers
124	Coaches and physical education teachers
125	Education teachers
126	English teachers
130	Foreign language teachers
131	Home economics teachers
132	Law teachers
133	Theology teachers
134	Trade, industrial, and technical teachers

071 Podiatrists
072 Veterinarians
073 Health practitioners, n.e.c.

Teachers, except college and university
141 Adult education teachers
N(142) Elementary school teachers
143 Prekindergarten and kindergarten teachers
144 Secondary school teachers
145 Teachers, except college and university, n.e.c.

Engineering and science technicians
150 Agriculture and biological technicians, except health
151 Chemical technicians
152 Draftsmen
153 Electrical and electronic engineering technicians
154 Industrial engineering technicians
155 Mechanical engineering technicians
156 Mathematical technicians
161 Surveyors
162 Engineering and science technicians, n.e.c.

Technicians, except health, and engineering science
163 Airplane pilots
164 Air traffic controllers
165 Embalmers
170 Flight engineers
171 Radio operators
172 Tool programmers, numerical control
173 Technicians, n.e.c.
174 Vocational and educational counselors

Writers, artists, and entertainers
175 Actors
180 Athletes and kindred workers
181 Authors
182 Dancers
183 Designers
184 Editors and reporters
185 Musicians and composers
190 Painters and sculptors
191 Photographers
192 Public relations men and publicity writers
193 Radio and television announcers
194 Writers, artists, and entertainers, n.e.c.
195 Research workers, not specified

MANAGERS AND ADMINISTRATORS, EXCEPT FARM

201 Assessors, controllers, and treasurers; local public administration
202 Bank officers and financial managers
203 Buyers and shippers, farm products
205 Buyers, wholesale and retail trade
210 Credit men
211 Funeral directors
212 Health administrators
213 Construction inspectors, public administration
215 Inspectors, except construction, public administration
216 Managers and superintendents, building
220 Office managers, n.e.c.
221 Officers, pilots, and pursers; ship
135 Miscellaneous teachers, college, and university
140 Teachers, college and university, subject not specified
230 Restaurant, cafeteria, and bar managers
231 Sales managers and department heads, retail trade
233 Sales managers, except retail trade
235 School administrators, college
240 School administrators, elementary and secondary
245 Managers and administrators, n.e.c.

SALES WORKERS

260 Advertising agents and salesmen
261 Auctioneers
262 Demonstrators
264 Hucksters and peddlers
265 Insurance agents, brokers, and underwriters
266 Newsboys
270 Real estate agents and brokers
271 Stock and bond salesmen
280 Salesmen and sales clerks, n.e.c.[1]

CLERICAL AND KINDRED WORKERS

301 Bank tellers
303 Billing clerks
P(305) Bookkeepers
310 Cashiers
311 Clerical assistants, social welfare
312 Clerical supervisors, n.e.c.
313 Collectors, bill and account
314 Counter clerks, except food
315 Dispatchers and starters, vehicle
320 Enumerators and interviewers
321 Estimators and investigators, n.e.c.
323 Expediters and production controllers
325 File clerks
326 Insurance adjusters, examiners, and investigators
330 Library attendants and assistants
331 Mail carriers, post office
332 Mail handlers, except post office
333 Messengers and office boys
334 Meter readers, utilities

Office machine opeerators
341 Bookkeeping and billing machine operators
342 Calculating machine operators
343 Computer and peripheral equipment operators
344 Duplicating machine operators

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1 Category "280 Salesmen and sales clerks, n.e.c" was subdivided in the Census into 5-occupation groups dependent on industry. The industry codes are shown in parentheses.

Occ. Code
281 Sales representatiges, manufacturing industries (Ind. 107-399)
282 Sales representatives, wholesale trade (Ind. 017-058, 507-599)

222 Officials and administrators; public n.e.c.
223 Officials of lodges, societies, and unions
224 *Postmasters and mail superintendents*
225 Purchasing agents and buyers, n.e.c.
226 Railroad conductors
345 Key punch operators
350 Tabulating machine operators
355 Office machine operators, n.e.c
360 Payroll and timekeeping clerks
361 Postal clerks
362 Proofreaders
363 Real estate appraisers
364 Receptionists

Secretaries
370 Secretaries, legal
371 Secretaries, medical
Q(372) Secretaries, n.e.c.
374 Shipping and receiving clerks
375 Statistical clerks

376 Stenographers

381 Stock clerks and storekeepers
382 Teacher aides, exc. school monitors
383 Telegraph messengers
384 Telegraph operators
385 Telephone operators
390 Ticket, station, and express agents
391 Typists
392 Weighers

394 Miscellaneous clerical workers

395 Not specified clerical workers

CRAFTSMEN AND KINDRED WORKERS

401 Automobile accessories installers
402 Bakers

403 Blacksmiths
404 Boilermakers
405 Bookbinders
410 Brickmasons and stonemasons
411 Brickmasons and stonemasons, apprentices
412 Bulldozer operators
413 Cabinetmakers
R(415) Carpenters
416 Carpenter apprentices
420 Carpet installers
421 Cement and concrete finishers
422 Compositors and typesetters
423 Printing trades apprentices, exc. pressmen

424 Cranemen, derrickmen, and hoistmen
425 Decorators and window dressers
426 Dental laboratory technicians
430 Electricians
431 Electrician apprentices
433 Electric power linemen and cablemen
434 Electrotypers and stereotypers
435 Engravers, exc. photoengravers
436 Excavating, grading, and road machine operators; exc. bulldozer
440 Floor layers, exc, tile setters
441 Foremen, n.e.c.
442 Foregemen and hammermen
443 Furniture and wood finishers
444 Furriers
445 Glaziers
446 Heat treaters, annealers, and temperers
450 Inspectors, scalers, and graders; log and lumber

283 Sales clerks, retail trade (Ind. 608-699 except 618, 639, 649, 667, 668,
284 Salesmen, retail trade (Ind. 607, 618, 639, 649, 667, 668, 688)
285 Salesmen of services and construction (Ind. 067-078,407-499,707-947)
453 Jewelers and watchmakers
454 Job and die setters, metal
455 Locomotive engineers
456 Locomotive firemen
461 Machinists
462 Machinist apprentices
Mechanics and repairmen
470 Air conditioning, heating, and refrigeration
471 Aircraft
472 Automobile body repairmen
S(473) Automobile mechanics
474 Automobile mechanic apprentices
475 Data processing machine repairmen
480 Farm implement

481 Heavy equipment mechanics, incl. diesel
482 Household appliance and accessory installers and mechanics
483 Loom fixers
484 Office machine
485 Radio and television
486 Railroad and car shop
491 Mechanic, exc. auto, apprentices
492 Miscellaneous mechanics and repairmen
495 Not specified mechanics and repairmen
501 Millers; grain, flour, and feed
502 Millwrights
503 Molders, metal
504 Molder apprentices
505 Motion picture projectionists
506 Opticians, and lens grinders and polishers
510 Painters, construction and maintenance
511 Painter apprentices
512 Paperhangers
514 Pattern and model makers, exc, paper
515 Photoengravers and lithographers
516 Piano and organ tuners and repairmen
520 Plasterers
521 Plasterer apprentices
522 Plumbers and pipe fitters
523 Plumber and pipe fitter apprentices
525 Power station operators
530 Pressmen and plate printers, printing
531 Pressman apprentices

533 Rollers and finishers, metal
534 Roofers and slaters
535 Sheetmetal workers and tinsmiths
536 Sheetmetal apoprentices
540 Shipfitters
542 Shoe repairmen
543 Sign painters and letterers
545 Stationary engineers
546 Stone cutters and stone carvers
550 Structural metal craftsmen
551 Tailors
552 Telelphone installers and repairmen
554 Telephone linemen and splicers
560 Tile setters
561 Tool and die makers
562 Tool and die maker apprentices
563 Upholsterers
571 Specified craft apprentices, n.e.c.

452 Inspectors, n.e.c.
575 Craftsmen and kindred workers, n.e.c.
580 Former members of the Armed Forces

OPERATIVES EXCEPT TRANSPORT

601 Asbestos and insulation workers
T(602) Assemblers
603 Blasters and powdermen
604 Bottling and canning operatives
605 Chainmen, rodmen, and axmen; surveying
610 Checkers, examiners, and inspectors; manufacturing
611 Clothing ironers and pressers
612 Cutting operatives, n.e.c.
613 Dressmakers and seamstresses, except factory
614 Drillers, earth
615 Dry wall installers and lathers
620 Dyers
621 Filers, polishers, sanders, and buffers
622 Furnacemen, smeltermen, and pourers
623 Garage workers and gas station attendants
624 Graders and sorters, manufacturing
625 Produce graders and packers, except factory and farm
626 Heaters, metal
630 Laundry and dry cleaning operatives, n.e.c.
631 Meat cutters and butchers, exc. manufacturing
633 Meat cutters and butchers, manufacturing
634 Meat wrappers, retail trade
635 Metal platers
636 Milliners
640 Mine operatives, n.e.c.
641 Mixing operatives
642 Oilers and greasers, exc. auto
643 Packers and wrappers, except meat and produce
644 Painters, manufactured articles
645 Photographic process workers
Precision machine operatives
650 Drill press operatives
651 Grinding machine operatives
652 Lathe and milling machine operatives
653 Precision machine operatives, n.e.c.
656 Punch and stamping press operatives
660 Riveters and fasteners
661 Sailors and deckhands
662 Sawyers
663 Sewers and stitchers
664 Shoemaking machine operatives
665 Solderers
666 Stationary firemen
Textile operatives
670 Carding, lapping, and combing operatives
671 Knitters, loopers, and toppers
672 Spinners, twisters, and winders
673 Weavers
674 Textile operatives, n.e.c.
680 Welders and flame-cutters
681 Winding operatives, n.e.c.
690 Machine operatives, miscellaneous specified
692 Machine operatives, not specified
694 Miscellaneous operatives
695 Not specified operatives
Health service workers
921 Dental assistants
922 Health aides, exc. nursing
923 Health trainees
924 Lay midwives
925 Nursing aides, orderlies, and attendants
926 Practical nurses
Personal service workers
931 Airline stewardesses
932 Attendants, recreation and amusement
572 Not specified apprentices
701 Boatmen and canalmen
703 Bus drivers
704 Conductors and motormen urban rail transit
705 Deliverymen and routemen
706 Fork lift and tow motor operatives
710 Motormen; mine, factory, logging, camp, etc.
711 Parking attendants
712 Railroad brakemen
713 Railroad switchmen
714 Taxicab drivers and chauffeurs
U(715) Truck drivers

LABORERS EXCEPT FARM

740 Animal caretakers, exc. farm
750 Carpenters' helpers
V(751) Construction laborers, exc. carpenters' helpers
752 Fishermen and oystermen
753 Freight and material handlers
754 Garbage collectors
755 Gardeners and groundskeepers, exc, farm
760 Longshoremen and stevedores
761 Lumbermen, raftsmen, and woodchoppers
762 Stockhandlers
763 Teamsters
764 Vehicle washers and equipment cleaners
770 Warehousemen, n.e.c.
780 Miscellaneous laborers
785 Not specified laborers

FARMERS AND FARM MANAGERS

W(801) Farmers (owners and tenants)
802 Farm managers

FARM LABORERS AND FARM FOREMEN

821 Farm foremen
822 Farm laborers, wage workers
823 Farm laborers, unpaid family workers
824 Farm service laborers, self-employed

SERVICE WORKERS, EXC. PRIVATE HOUSEHOLD

Cleaning service workers
901 Chambermaids and maids, except private household
902 Cleaners and charwomen
X(903) Janitors and sextons
Food service workers
910 Bartenders
911 Busboys
912 Cooks, except private household
913 Dishwashers
914 Food counter and fountain workers
Y(915) Waiters
916 Food service workers, n.e.c., except private household
980 Child workers private household
981 Cooks private household
982 Housekeepers, private household
983 Laundresses private household
Z(984) Maids and servants, private household
995 OCCUPATION NOT REPORTED2

ALLOCATION CATEGORIES3

196 Professional, technical, and kindred workers--allocated

933 Attendants, personal service, n.e.c.
934 Baggage porters and bellhops
935 Barbers
940 Boarding and lodging house keepers
941 Bootblacks
942 Child care workers, exc, private household
943 Elevator Operators
944 Hairdressers and cosmetologists
945 Personal service apprentices
--
950 Housekeepers, exc. private household
952 School monitors
953 Ushers, recreation and amusement
054 Welfare service aides

Protective service workers
960 Crossing guards and bridge tenders
961 Firemen, fire protection
962 Guards and watchmen
963 Marshals and constables
964 Policemen and detectives
965 Sheriffs and baliffs

246 Managers and administrators, except farm--allocated
296 Sales workers--allocated
396 Clerical and kindred workers--allocated
586 Craftsmen and kindred workers--allocate
696 Operatives, except transport--allocated
726 Transport equipment operatives--allocated
796 Laborers, except farm--allocated
806 Farmers and farm managers--allocated
846 Farm laborers and farm foremen --allocated

976 Service workers, exc, private household--allocated
985 Homemaking
986 Private household workers--allocated

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[2]2 This code is used to identify not reported occupations in surveys where the not reported cases are not allocated.

33Those returns from the Population Census which do not have an occupation entry are allocated among the major occupation groups during computer procession. These cases are labeled with the code for the "allocation" category to which they are assigned. (See text, page IV).

995 "Nothing", Travel
996 School
997 Military (unless specific job indicated)

APPENDIX C

	GRADE 8				GRADE 11			
	Male		Female		Male		Female	
Code	White	Minority	White	Minority	White	Minority	White	Minority
0	921	147	833	154	866	192	972	150
1	13	13		1	29	3	22	3
2	35	7	13		17	1	7	
3	8	1	3	1	11	3	4	1
4			1		1		1	
5	7	1	5	1	9	1	5	1
6	1				4	1	1	
7			1					
10	1				5	2	2	1
11	2		1		7	2	1	
12	7	1			14	3	2	1
13					1		1	
14	4				4	1		
15	1		1		2		1	
21	1				1			
23	6	2	5		26	7	7	2
24	1				1			
25	38		9	1	47	3	17	
26					1		1	
30	3	1	1				1	1
31	47	2	42	3	26	6	28	5
32	1		3				5	
33	1						1	
34					4			
35			1		6		2	
36					3			
42					4		3	
43	3	1	1		3			1
44			2		8	1	11	
45	3		1		2	1	1	
51	1		2				2	
52	9	1	6		9		3	1
53	4	1	2		4			
54	6	1	7		12	2	5	

	GRADE 8				GRADE 11			
	Male		Female		Male		Female	
Code	White	Minority	White	Minority	White	Minority	White	Minority
56				1			1	
61	2							
62	16		2	2	12	2	4	1
63			2					1
64			1		8	1	6	
65	32	5	43	12	23	1	11	2
72	14	2	64	4	9	1	20	2
73	5	2	11	2		2	7	1
74							5	
75	1		83	29	1	1	54	17
76	1		30	3	2	1	48	5
80	1		3		2	1	13	1
81			6		1		12	
82							2	
83	1		3		1	1	12	1
84							4	
85			6		4		16	3
86	2		1		5		2	
90							5	
91					1		4	
92	3		2		1		2	
93	3		6	1	6		21	1
94							2	
95			2				1	
96	6		11		3		1	
100	2	1	26	2	7		47	6
101	1		1		2		3	
102	1							
103			1				1	
104		1				1		1
107			1					
108					1			
110					1			
112			1	1	1			
114						1		
115							1	

	GRADE 8				GRADE 11			
	Male		Female		Male		Female	
Code	White	Minority	White	Minority	White	Minority	White	Minority
120	2		1		1		2	
122			1				1	
123	3		6		1	2	4	2
124	5		5	1	3	3	7	2
126			1		3		1	
127			1					
128		1						
130			7				8	
131							2	1
134							2	
140	1				2	1	2	
142	1		20	3	1		22	
143			22	2	1		11	2
144	6	1	17	1	2		8	1
145	13	3	70	17	24	8	49	9
150	2		4		1		10	1
152	8	1	1		16	1	2	
153	5	1			8	3	1	1
154	3							
155	1							
156					1			
162	7	1	3		8		2	
163	36	2	3		16	2	5	
165					1	1		
170	1						1	
173	2		2	1	5	2	1	1
174			5	1	1		2	
175	4		23	4	11		9	1
180	87	20	11	1	23	9	5	
181			5		2		4	
182			4	2			3	
183	3		23	1	1	1	23	4
184	3	1	10	1	6	1	19	3

	GRADE 8				GRADE 11			
	Male		Female		Male		Female	
Code	White	Minority	White	Minority	White	Minority	White	Minority
185	7	1	26	1	18	3	15	1
190	3	1	5		3		5	2
191	8	1	14	2	8	1	9	4
192	1	1	4		4		5	
193	11		1	2	8	1	2	1
194	20	6	45	17	18	7	42	10
195	1	1	4		5		4	1
199							1	
200	1				2	1	1	
202	3	1			6	1	2	
205			1				5	
211	2		1		1			1
212					2			
214							1	
215					1			
220	2				7			
221	3				2			
222	5		7		1		4	
224	1				1			
225	1				1		1	
226					1			
227					1			
230	2				8		1	
231	3		1		9	2	12	
233	1							
242	1							
245	37	6	11	1	31	8	25	6
246							1	
253	1							
254	1							
265	2				2	1	1	
269	1							
270	5		2		4		5	
271					1			
274			1					
280	11		13	2	11	1	13	6

	GRADE 8				GRADE 11			
	Male		Female		Male		Female	
Code	White	Minority	White	Minority	White	Minority	White	Minority
282					1			
283			3					
299		1						
300	1	1	3			1		
301			3			5		
305			2		2		11	1
306							1	
307			1					
310			3		1		8	
312			1					
314			1	1			3	1
317						1		
321					1			
323						1		
324			1					
331		1			1			
332			1					
343				1	2		2	1
345			3	1	1		8	1
355			1		1			
361	2				1			
363							1	
364			4				12	4
370			3				17	
371							6	
372			64	18		1	81	16
374	1							
375	1							
376							5	2
381					2			
382			2	1			1	1
385							1	
390					1			
391			2				9	4
394					1	1	4	2
395	2	2	6		3	1	9	4
402	1							

	GRADE 8				GRADE 11			
	Male		Female		Male		Female	
Code	White	Minority	White	Minority	White	Minority	White	Minority
403			1					
410	1		1		2	1		
411					1			
413	1				2	1		
415	32	9			19	5	1	
416	1							
419							1	
421					2			
423						1		
424			1					
425			9		1		9	
426			1					
430	26	5			10		1	
431	1							
432	1							
433	1		1					
436	1				2			
443	1							
453							3	
455		1						
461	2				5			1
462	23	5	1		14	1	2	
470					1			
471	7	1	1		4	1	1	
472	7	1			4		1	
473	28	3	5		25	4	1	
474	2							
481	4	1			1	1		
485					1	1		
491	1							
492	1				1			
495	1				1			
498							1	
501					1			
503	1							
510	2				2			
520			1					

	GRADE 8				GRADE 11			
	Male		Female		Male		Female	
Code#	White	Minority	White	Minority	White	Minority	White	Minority
522	8				1		1	
523					1			
530	1		1		6	2		
535					2			
541	1							
546					1			
550	1							
551							1	1
552					1			
561	1				3			
572	1		1			1		
575	4	1	3		4		1	
602							1	
613								1
615	1							
623	4							
624	1							
630					1			
631	1				3			
635					1			
642							1	
650	1							
662					1			
674							1	
680	6	1			5		1	
690	2							
692	1							
694						1		
695	7		2					
702			1					
703			1					
704					1			
705					1			
706						1		
714	1							
715	31	10	5		9	4	1	1

	GRADE 8				GRADE 11			
	Male		Female		Male		Female	
Code	White	Minority	White	Minority	White	Minority	White	Minority
723		1						
724	1							
734	1							
740	9	1	45	2	1		1	
751	6	2	1		3	1		1
752					1		1	1
754		1		1				
755			1		1		1	
760					1			
761	1				1			
771							1	
780	3				2			
785	2				1	1	1	
801	3		1	1	3			
802		1	2					
804							1	
822					1		2	
824	14	2	4		2	1	5	
903	1							
910	1				1			
912	3		2	1	6	3		1
913	1							
915			11					
916	2		6		2		2	
921			2				7	
922			10				6	
923							3	
924							1	
925			5				2	
926			2	1			4	2
931			33	15	1	1	22	3
933	1		1				1	
935			1		1		2	
942	1		18	2	1		11	1
944	1		28	8			23	3
945					1			
951		1						

	GRADE 8				GRADE 11			
	Male		Female		Male		Female	
Code	White	Minority	White	Minority	White	Minority	White	Minority
952							2	
961	3	1			5	2	1	1
962	2		1		4		3	
963			1					
964	24	5	4	5	21	3	12	2
965	1							
972					1			
973							1	
980			2					
982			1					
984			1					
985	7	3	39	7	5		80	8
991	1							
995	7	1	5	5	15	1	33	7
996	22	1	13	5	45	16	66	16
997	36	5	5	3	48	17	12	11